THE VETERINARY JOURNAL

AND

Annals of Comparative Pathology.

AUGUST, 1881.

THE OPERATION OF CASTRATION, AS PERFORMED WITHOUT CASTING THE ANIMAL.

If the risk of operation to the animal be minimized, as a rule it means increased risk to the operator. We, as veterinary surgeons, are at considerable disadvantage in any surgical operation, from the necessity there is to employ forcible restraint, in order to ensure the safety of ourselves and our patients; and however carefully the restraint may be applied, with some nervous beasts, and with others of resolute dispositions or which are rebellious under restraint, fractures of the spine, limbs, or muscles will occasionally occur, to the annoyance and loss of both owners and operators.

Bulls I have always been accustomed to castrate in a standing posture, and I fail to see the necessity for casting them; but with horses the case is different; and after seeing the operation repeatedly performed while the animal was standing, and also performing it myself, I have come to the conclusion that the innovation is of use only in particular cases, and for the following reasons: 1st, *The increased danger to the operator;* 2nd, The operator requires to be both resolute and expert to succeed—timidity would be fatal; 3rd, When the testicles are not well down in the scrotum, and the cremaster muscle acts powerfully, the operation cannot always be accomplished; 4thly, In some animals, even with the most expert and resolute of operators, it is impossible to perform the operation in this posture,

crouching alone, if persistent, being sufficient to baffle the operator.

On the other hand, it ought to be recognized by our profession as a practicable position when it is decided to operate on aged horses, especially if there be reason to suspect anchylosis of the spine, either partial or complete; in colts when there is a known faulty condition of the bones—as in Fragilitis Ossium—or when a previous colt from the same dam or sire, or both, has injured himself by being cast; also in animals whose struggles when "roped" are such as to cause apprehension: these may be quieter with the modified restraint as used in the standing operation.

The first suggestion to perform the operation standing came from a Mr. Mathews, an American castrator; but whether it originated with him or not I cannot say. He has been some years in this country, and is regularly engaged in operating on horses standing. He is a powerful, man and a resolute operator, although past middle life. He is successful in the majority of cases, I believe, but has failed in others. The preparation of his clams he keeps a secret, but he is willing to sell this secret at a given price, providing the purchaser binds himself not to divulge it. He does not object to any one seeing him operate; and after witnessing the operation, I remarked that to keep the matter secret he should not allow people to see it, as we had already seen quite sufficient to enable us to perform his operation. He gave full and free permission to perform the operation, but warned us that if we failed, and then came back to purchase the secret, a much higher price would be demanded. On my suggesting to him that the operation was the same whether performed with the animal standing or recumbent, from a surgical point of view, he failed to perceive the identity. The *modus operandi* is as follows: the animal to be operated upon is placed against a wall on the off side, with another wall behind him at right angles; or, in other words, the horse is backed into a corner with his body parallel with the wall on his off side, and pushed close up against the other with his tail (fig. 1).

A rope from a ring in a staple about two feet from the ground or higher, just in front of the off fore leg, is passed over his neck in the situation of the collar, and made fast to prevent his plung-

ing or rearing. A man stands at his head holding a twitch on the animal's nose, while another presses him against the wall and

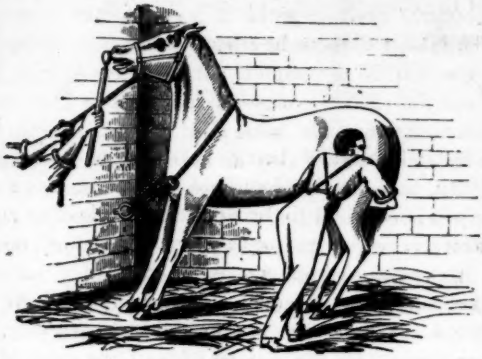

FIG. 1.

manages the shoulder rope. The operator stands on the near side, first stroking the quarter and then the inside of the thigh, until the animal is somewhat reconciled to being touched in the neighbourhood of the scrotum. Then the testicles are grasped by the left hand, or this is passed above the testicles, with the cords between the two middle fingers, and pressure is brought to bear downwards and backwards until the scrotum covering the testicles is tense; a knife, in shape like the Syme abscess-knife (but a trifle larger and stronger than that in general use), is plunged into the body of each testicle, and an incision made from before backwards, sufficiently large, with the pressure of the left hand and the half-divided state of the glands, to force them out of the scrotum. The rapidity with which these *two* cuts (one in each testicle) can be made by an experienced operator is such as to lead onlookers to exclaim, "Marvellous!" This I regard as the most difficult part of the operation, and any one becoming expert in making these two incisions will generally succeed, as directly they are made the animal arches his back, and shows unmistakable signs of feeling faint and little inclined to offer further resistance. The testicles are now hanging loose and half-divided outside the scrotum; a wooden clam (fig. 2) is then put on the right cord, the right hand of the

operator being passed round the back of the thigh with whatever there is to secure it. Mr. Matthews uses a leather ferrule, with the end of the clam tapering to receive it (fig. 3).

FIG. 2.

FIG. 3.

His caustic, instead of being a greasy ointment, presents a black, rough, and dry hard surface, somewhat like sand-paper. A good grip is required to bring the clam close enough; when the cord intervenes, to get on this ferrule; the left cord is then treated in the same manner. A blunt pointed clasp-knife removes the glands, and the operation is complete. Next day, of course, the clams are removed in the ordinary way, adhesions are broken down, and the divided ends of the cord are returned through the aperture into the scrotum. To prevent swelling, the horse should either be freely exercised at a walking pace, or put to slow work, care being taken not to allow him to get wet on the loins.

In castrating bulls in the standing position, the end stall of an ordinary cow-shed is selected, with the animal "*sealed*"* on the right-hand side of the stall, against the wall. A man, with a pair of "bull-dogs" in the nose, draws the head to the left side, and, if necessary, is assisted by another man at the horns; while either one or two others, as the case may require, press him against the wall. If only one, he should stand at the flank, and with the left knee half flexed and pushed under, he will prevent either the animal from lying down or crouching inconveniently. He should also hold the tail. If it is a large, powerful animal, and more help is thought necessary, place another man in a similar position at the chest, and give them a firm hold of a rope or rail secured to the wall over the back of the bull.

The operator stands at the back and somewhat to the left. For myself, I prefer the ligature in operating on the bovine species; although I see no reason why the other methods might not be used, if preferred.

* The fastening of a cow with the chain round the neck is called "sealing" in Lancashire and Yorkshire.

THE HORSE-SICKNESS OF SOUTH AFRICA.

BY D. HUTCHEON, M.R.C.V.S., COLONIAL VETERINARY SURGEON, CAPE COLONY, SOUTH AFRICA.

THE following crude description of a hurried investigation into the nature of the disease called "South African Horse-sickness" may have a little interest for some of the readers of the VETERINARY JOURNAL; and as I am not likely to see any more cases this season, I send you the description as far as it goes, imperfect though it be.

On my arrival at Bedford (S.A.) on the evening of April 25th, I was informed that a mare belonging to a native had died early that morning from Horse-sickness. It was then late, and the carcase was lying on the commonage at a considerable distance; nevertheless I determined upon making a *post-mortem* examination, being anxious to learn, if possible, something concerning the nature of this destructive malady. I made as careful an examination of the carcase as the circumstances would admit, and had the principal internal organs carried into Bedford for a more minute examination on the following morning.

The prominent pathological appearances were as follows:—

A great quantity of frothy mucus had escaped through the nostrils; the head and neck were slightly swollen, and the abdomen was tensely distended with gas. On removing the skin I found an effusion of a bright yellow gelatinous-looking substance into the cellular tissue of the inferior portion of the neck, extending throughout its whole extent, being in greatest quantity immediately surrounding the antero-inferior portion of the trachea and œsophagus. On opening the thorax it was found to contain a large quantity of a dark-coloured fluid, having a red tinge when held up to the light; the pericardium was distended with fluid of a similar character, while effused into the mediastinal space, and surrounding the heart, œsophagus, trachea, etc., was a great quantity of this bright yellow jelly substance; the lungs were considerably enlarged, and of a bright yellow colour on the surface. This colour was due to the effusion of this same jelly-looking substance under the subserous layer and into the interlobular tissue, especially around the borders of the lungs, giving

the edges a bright, glistening, translucent appearance when held up to the light.

On making a section of the lung it had a bright pink colour; the trachea and bronchial tubes were filled with frothy mucus to their minutest ramifications. On the removal of this mucus you could see minute petechial spots studded over the mucous surface, principally in the trachea and larger tubes. On squeezing the lung it emitted a sound like that from a stiff sponge when filled with soap-suds.

On opening the heart the blood in the right ventricle was quite black and perfectly fluid; the left ventricle contained a clot of yellow jelly, with a little dark fluid blood. On cutting open the large blood-vessels the blood flowed out, black and tarry-looking, with an entire absence of clots or moulds of the vessels. Studded over the surface of the endocardium were a number of small dark spots, being in greatest numbers on the *musculi papillares.*

On opening the abdominal cavity a quantity of fluid escaped, similar to that found in the thorax; the liver appeared of a slightly bluish slate colour and very friable; the spleen was normal in size, but black and pulpy when cut into; the kidneys appeared healthy, but in the pelvis there was a quantity of jelly-like mucus.

On opening the stomach I found a few small clots sticking to the cuticular portion, but it appeared otherwise healthy; the villous portion, on the other hand, was very much congested, and of a dark port wine colour; the epithelium was removed by the slightest touch, leaving the mucous membrane granular-looking and very much thickened; the rugæ were scarcely observable; the small intestines were similarly affected to about half their extent, and in the parts which did not present this congested appearance there was a thick coating of yellow jelly-looking mucus. There were several dark congested spots, varying in size, in the colon. I did not examine the brain.

On examining the blood under the microscope I found great numbers of the rod-like bodies termed bacteria, and taking this fact in connection with the other pathological appearances, I came to the conclusion that the disease from which the animal died was of the nature of Anthrax; but on making inquiry I

found that this mare had been ridden a long distance on the day previous to her death, which would have an influence on the character of the blood. I was anxious, therefore, to see another case before giving an opinion. Meantime I inoculated a goat with a small quantity of the blood, injecting it subcutaneously into the cellular tissue in front of the chest. The part commenced to swell almost immediately, the swelling extending along the inferior portion of the thorax and abdomen, and involving both shoulders. The goat died on the third day. There was no perceptible change in any of the internal organs, but on placing the blood under the microscope I could detect the characteristic germs, but only in the blood and tissues involved in the swelling, not in the general circulation.

I inoculated another goat from this one, this time in the tail, using only a small quantity. The swelling, as in the other case, commenced immediately, but I lanced it freely, which allowed the serous fluid to exude as it formed. This goat lived five days; but being obliged to leave the district the day it died, I had no time to make a minute examination of the blood. A few days previous to this, however, another horse died from the "Sickness." This horse had been regularly stabled during the night, but on Saturday evening, April 30th, he could not be found, and consequently remained out all night. On the Tuesday morning following he died. I was there in time just to see him die. In this case there was no escape of frothy mucus from the nostrils either before or after death; the tongue was swollen, and protruded from his mouth; the lips were also swollen, and exuded a yellow serum when lanced; the blood was dark-coloured as in the other case, but was not entirely devoid of clots; there was scarcely such a quantity of that yellow jelly effusion in the thoracic cavity as in the other case, but the small intestines were congested throughout their whole extent and a considerable portion of the colon; in all other respects the *post-mortem* appearances were similar to the one already described. On examining the blood under the microscope I could not detect bacteria in the blood generally, but I found them on the surface of the mucous membrane of the stomach and small intestines. I determined now upon inoculating a horse from this one; and as

there was a lame one running on the commonage, though otherwise healthy, I communicated with the owner and purchased the animal. I injected a small quantity of the general blood into the cellular tissue in front of the chest. The part inoculated commenced to swell next day. On the fifth day I opened the swelling, when a quantity of watery fœtid fluid escaped. I examined this fluid, and also the blood from the vessels of the part: both contained these rod-shaped bodies in abundance. The horse continued to feed, and appeared all right until the ninth day after being inoculated, when he became dull; temperature little altered. On the morning of the tenth day he refused his food; at 11 a.m. he lay down and manifested symptoms of abdominal pain, which continued until 5 p.m., when he died. As I was telegraphed for to go to another district on the following morning, I was obliged to make a *post-mortem* examination that night by candle-light on the veld (common). Dr. Rees, the district surgeon, and two other gentlemen, kindly consented to accompany me, in order to certify to the appearances exhibited. I may here remark that Dr. Rees took a great interest in the whole of these experiments, and agrees with me in my opinion of the disease that it is Anthrax. The pathological appearances in this case very closely resembled those seen in the others that died from the disease, especially the condition of the thoracic visceræ. The blood appeared almost normal, and formed a good firm clot; the stomach presented the same appearance as in the others; the congested condition did not extend to the intestines, but there was a great quantity of that gelatinous mucus extending throughout the greater portion of the small intestines. In addition, the liver was enormously enlarged, almost globular in form; the walls of its blood-vessels were ruptured, leaving only a distended trace of their presence; the liver substance was very granular in appearance and extremely friable; the colour was a little browner than natural. Glisson's capsule was ruptured over the quadrate lobe. I had not time next morning to make a microscopic examination of the blood and other fluids, and when I returned on the third day afterwards decomposition was too far advanced for any satisfactory examination to be made. I looked for, but could not

detect, bacteria of any kind in any of the tissues or fluids left.

Two other cases of death from this disease occurred within a few days of one another: one, a mare, died in the pound; the other, also a mare, died on the veld. In both the pathological lesions exhibited were essentially the same as in the first case, only that the spleen in each of them appeared normal both in size and appearance. Bacteria were found in the blood generally, but not in any of the organs of the body. There was one thing noticeable in these four cases: two were at rest during the attack —viz., the one in the pound, and the one that died in the stable— and from neither of these was there any escape of frothy mucus from the nostrils, either before or after death, although the trachea and bronchial tubes were quite as full as in the other cases; the other two were wandering about on the veld during the attack, and when I saw them a great quantity of frothy mucus was lying in front of their nostrils, partly dissolved.

Such is a hurried description of the disease called "South African Horse-sickness" as it has come under my own observation in this district. You are aware that the disease occurs in certain localities only; is most prevalent in summer or early autumn; is less prevalent in wet seasons, like what the present one has been; is never observed after one or two good frosts; and that animals which are kept constantly stabled at night are considered safe, also those removed to high ground. I am sorry that my description is so incomplete, but the cases occurred at a time when I was very busy investigating the nature of a contagious form of Pleuro-pneumonia in goats, in my opinion introduced into this colony by the importation of some Angora goats from Asia Minor, an account of which I will send as soon as I can find time.

ON A HORSE DISEASE IN INDIA KNOWN AS "SURRA," PROBABLY DUE TO A HÆMATOZOON.

BY G. EVANS, M.D, M.R.C.V.S., ARMY VETERINARY INSPECTOR, INDIA.

(Continued from page 10.*)*

Post-mortem of Camel No. $\frac{8}{70}$.—There was no abnormal amount of serum in the peritoneal cavity, and no layer of lymph such as I found in Surra horses. The organs were all perfectly healthy. Intestines opened and examined throughout, and found perfectly healthy. But in the right ventricle of the heart and in the pulmonary arteries I found tangled masses of filaria several inches long, which I suppose to be the mature form of the embryos I had found by means of the microscope. I have had no time yet to examine them in detail, neither has Dr. Lewis, to whom I have submitted specimens; but they are certainly thicker than the single specimen of the mature *Filaria sanguinis* which he found in man.

On the 9th October camel No. $\frac{61}{80}$ was destroyed (by bleeding, the same as the other), and *post-mortem* examination made. I found a large quantity of very clear serum effused both in the peritoneal cavity and in the pericardial sac, just as I found in Surra horses, but there was no fluff of lymph on the parietal peritoneum. The organs were all perfectly healthy. The Surra parasite lived longer, by several hours, in the blood of this camel after it was drawn from the body, than I found it doing in the blood of horses.

I was informed that the 4th Sikhs have lost the following numbers of camels during the past three years, and, with two or three exceptions, they are all supposed to have died from Surra:—

In 1878 there died 29 camels,
„ 1879 „ 41 „
„ 1880 „ 28 „

and there were ten on the sick list for it in October.

It is a subject for consideration whether many of the camels

which wasted away and died on our frontier, in the transport service, during the late war suffered from Surra.

Nawab Khan, the camel jemadar of the 3rd Punjab Infantry, has the reputation of knowing more about camels than anybody else in the district, and he communicated to me the following information, as interpreted by Major Money, 4th Punjab Cavalry :—

"The prevailing opinion among the natives in this district is, that Surra is caused by the bite of a large brown fly, the size of a small bee, called *Bhura Dhung*. In the month of May that fly comes from the ground in jungle land that has been under water. In June and July the flies are very numerous and in full force. About the 15th of August they begin to diminish, and early in October they are obtained with difficulty. The fly bites cattle and donkeys, but they suffer no ill effects; it bites men, and a painful swelling follows; it bites horses and camels, and gives them a fatal disease known by several names, such as *Khanhog*, *Doaia*, and *Surra*, depending upon the several stages. *Phipri* is another name by which it is known among camels. I know of no reason for saying that the fly causes the disease, except the common tradition of my people. The symptoms of the three stages of the disease in the camel are these :—First stage, *Khanhog*—Refusing food for one week. Sluggish, with the urine of high colour. Sometimes they get well from this stage, if treated early; but at this stage we cannot be sure that it is the beginning of Surra or some other disease. If the medicine does no good, they swell all over the chest, which is the second stage, called *Doaia*. The third stage, called *Surra*, is when the swelling increases and extends all over the abdomen and legs, when they rapidly waste, and their recovery is hopeless. If a camel ever recovers from Surra, he is useless for two years after. The urine usually remains high coloured during the hot season, and becomes natural in the cold weather. The urine is often very thick in Surra, because the flesh passes out of the body in that way. The duration of each stage is very various: in severe cases they die in a week, in milder cases they live two or four weeks, in still milder they live two or three months. They seldom live four months. The treatment adopted is the adminis-

tration of a bitter extract made by boiling the leaf of a tree called *Swah* or *Vunna*, growing in the hills. The extract is given mixed with butter."

I do not know whether dogs are affected with this disease naturally, but I succeeded in communicating it to them from a horse by inoculation (*vide* Appendix I.).

I took every opportunity of asking the zemindars at the outposts whether they knew of the disease among cattle and donkeys, and they all assured me in the negative. Colonel McLean, 1st Punjab Cavalry, however, was told by one zemindar that "cattle do suffer from it, and they get it in consequence of eating *Dhesla* grass, which grows upon inundated land, some part of which, either the root or other portion, contains a worm, or an insect of some kind, in June or July. The cattle eat it then, and it gives them the seeds of the disease, which does not break out before the cold season." I mention this to record that it was brought to my notice, and that I made special inquiries about it among the natives; but not one of them to whom I spoke had heard of it before.

CAUSES.—The causes may be divided into three classes, the Proximate, Remote, and Ultimate.

A. *Proximate Cause.*—It has been shown above that the disease is one of the blood, and not of any organic structure of the body; and that it is a specific blood disease has been proved by the experiments detailed in the Appendices D to I. When the diseased blood is introduced beneath the skin or into the stomach of a healthy animal, the blood of that animal becomes diseased likewise, and the same series of general constitutional disturbances appear in him as characterised the disease of the animal from whose vein the blood was taken. There is, therefore, some virus in the blood which, when it is transferred into a healthy animal, is as sure of growth and propagation as if we introduced seeds into the garden, or the roe of fish into a suitable stream—the like reproducing its like, and no other. Let us now examine the diseased blood, to find in what respect it differs from healthy blood, so far as the microscope can reveal. In the early stage of the disease the normal elements of the blood—the white and red corpuscles, and serum—appear healthy, and in a normal

proportion to each other; but there is a new element abnormal, and not hitherto found in any other disease. It is a living and exceedingly active parasite. There may be only one in the field of the microscope, or there may appear to be as many as there are of corpuscles. They are exceedingly small, having a diameter of about $\frac{1}{8}$ or $\frac{1}{10}$ that of a large corpuscle, and with the motion of an eel. I shall describe them more in detail presently. During the progress of the disease the parasite does not remain always in the same proportion: this varies with successive broods. The general symptoms are also variable. I am not able to prove that a definite relation exists between the variable number of the parasites present and the course of the symptoms, but I think it is probable. However, by-and-by, besides the presence of the parasite, the elements of the blood become abnormal. The first change is an increase in the number of white corpuscles. Sometimes $\frac{1}{3}$ or even $\frac{1}{2}$ the number of corpuscles in the field will be the white, and there is a remarkable increase in the number of the large granular white corpuscles. The next change probably will be in the red corpuscles, a large number of which will be like shapeless particles of pale-red jelly, from half the size of a normal corpuscle downwards. The last change observed will be a large number of small granular particles in the serum. I wish to note particularly that the first *apparent* change in the blood is the presence of these foreign bodies, the parasites; and that the other changes mentioned do not appear in some cases for several weeks afterwards; but with the advent of the parasites there is a very general constitutional disturbance: first, a lowering of the temperature; second, an abnormal elevation of it; third, Jaundice, with petechiæ on the mucous membranes; fourth, dropsical swellings, etc. The question suggested by these facts is, whether the presence of the parasite is the cause of the disease, or whether the disease is the cause of the appearance of the parasites. That they are most intimately related to each other is beyond reasonable dispute. There are some eminent pathologists in India who deny the parasitic origin of specific blood diseases: they say the cause of all such diseases, from Small-pox to Anthrax Fever, is not any organic spore, germ, or ova, or parasite of any kind, but some purely chemical agent which has never yet been

discovered; and that these organisms develop at once in blood which has been so chemically altered, each chemical virus developing its specific organism, the spores or ova of which are *supposed* to be in the normal blood, ready to develop as soon as chemical changes favour them. The organisms themselves, even when developed, are supposed by them to be harmless. That is one of the most vexed questions of the present day in the pathological world, and it strikes hard at the root of the science and practice of sanitation. Against the above theory it is contended, *first*, that we should judge the unknown by the known; this supposed specific disease virus is not known to chemistry, and there is no known pure chemical agent that acts in any way analogous to the specific virus of fevers, one dose of which, when taken into the stomach, gets into the blood, multiplies itself there a million-fold, and produces a constitutional disturbance lasting for weeks or months; and a few drops of that living blood, after the lapse of many weeks since it was first chemically impregnated, if placed beneath the skin of a healthy animal, will, by chemical action alone, multiply and reproduce the same disease, and so on *ad infinitum*. In considering this subject we must bear in mind that the same blood does not remain long in the circulating vessels, but that it is in a constant state of renewal; and, so far as we have any knowledge of pure chemical non-corrosive poisons, when only one dose is given it either precipitates and remains harmless, because there is too little of it, or else it is passed out with the effete blood, and leaves the system uninjured, or it rapidly causes death. *A small dose of pure chemical poison has never been known to multiply itself in the system faster than the excretive organs can get it out of the blood;* nor has there been anything analogous to that performed by any ingeniously contrived apparatus at any chemical laboratory that I am aware of. *Secondly*, it is contended that specific self-propagation of like by like is the most characteristic feature of living organisms, as distinguished from purely non-vital chemical agents; so that if we never found any foreign living organisms in the blood in specific disease, reasoning by analogy from the known to the unknown would lead us to believe that the disease was due to propagating living organisms present in the blood, though un-

seen. *And, thirdly,* it is contended that the microscope has enabled us to see such living organisms as are efficient causes in the blood to develop the diseases in question. In reply to this they say that organisms so like these as not to be distinguished by the microscope are found also in some healthy subjects, and appear to do no harm; therefore we should not conclude that the one is any more virulent than the other. The answer to that objection is this: We must not always judge by appearances, but rather by actions. There is an old saying, worthy of being remembered in our intercourse with men, that "the fool is considered wise until he speaks." It is not by vision, but by noticing results, that we first learn that one snake is poisonous, and another not very unlike it is harmless; that one berry is a deadly poison, and another berry very like it is wholesome. It is after we learn this that we notice the specific differences in the appearances of the snakes and the berries; but if the snakes and the berries were as small as some of the organisms we find in the blood, no microscope could enable us to see the slightest difference between the poisonous and the non-poisonous. We therefore must judge of them by their results or associations, and we do it in this manner:—We often find organisms A, B, and C in healthy animals, and therefore conclude they are harmless. But we also invariably find organisms undistinguishable in shape from A, B, and C present in the very first stage and throughout the course of diseases 1, 2, and 3—A always abundant in 1, never in 2 or 3; B always abundant in 2, never in 1 or 3; and C always abundant in 3, but never in 1 or 2. The blood of 1, 2, and 3, containing the organisms A, B, and C, if put under the skin or into the stomach of healthy animals, will invariably reproduce 1+A, 2+B, and 3+C, but no other associations. Again, if we destroy A, B, C, or remove them from the blood of 1, 2, 3 by filtration, and then inoculate healthy animals with the blood so treated, we shall either reproduce the disease in a very mild and modified form, or else not at all. A pure chemical virus would be in a state of solution, and would not be in the least affected by the filtration. From which results we conclude that the organisms A, B, and C are the cause of the diseases 1, 2, and 3, though from other observations we find that organisms

undistinguishable from A, B, and C in *appearance*, are harmless.

Those who believe that these organisms cause the diseases with which they are associated, do not agree as to how the cause operates. There are three theories given to explain. First, that they block up the smallest capillary blood-vessels, and so produce congestion and local inflammations, etc. Second, that they deteriorate the blood, by absorbing the oxygen necessary for the performance of the vital functions of the animal economy. Third, that they secrete from themselves something that is noxious, and which vitiates the blood; and while they are in the blood they reproduce this faster than the excretory organs of the patient can get rid of it. The first and second theories will not apply to the Surra parasite, which most probably operates according to the third theory.

(To be continued.)

ON BURSATTI.

BY R. W. BURKE, M.R.C.V.S., EDINBURGH.

(Concluded from page 24.)

"*Shape of the Cells.*—'It would appear,' says a writer on 'Epithelioma' of the human subject, 'that where the Epithelioma affects a mucous surface with cylindrical epithelium (as that of the intestine) the cells are of a cylindrical type rather than of the more usual squamous variety, and *vice versâ*.' This statement, however, is incorrect. I have detected *columnar* (*cylindrical*) cells in a Bursatti tumour from the *cutaneous* surface, which is clothed by the squamous variety of epithelium (fig. 6).

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

The shape the cells assume depends materially on the pressure to which they are subjected. Thus I have seen in the Bursatti sections spindle-shaped and elongated (fig. 7) cells, quadrangular (fig. 3) and oval (fig. 5) cells, and cells giving off one or more processes (figs. 6 and 9).

"The arrangement of the cells in concentric laminæ (figs. 2, 9, 10, and 11) is the most characteristic feature of the disease. It is these cells that assume spindle-shaped characters, and become converted into *fibres* and *bands* from the resulting outward pressure induced by the augmented endogenous growth occurring in the centrally entrapped (?) cells. Many of the cells show sub- or endo-cells (figs. 3, 6, and 8)."

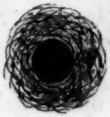

Fig. 10.

In conclusion, I would here offer a practical suggestion. Dr. Beale has so well expressed my own views on Cancer (Bursatti) that I cannot do better than quote him verbatim:—"The great difficulty of deciding as to the cancerous or non-cancerous nature of a tumour arises principally from the fact that no single element of which the structure is composed can be looked upon as characteristic of the cancerous form of growth only. Neither the character of the cells, nor the structure of the matrix, nor the arrangement of the elementary constituents can separately determine the point, and it is *only by carefully noting the collective appearances* observed upon microscopical examination that we can decide. In the great majority of cases, however, it is possible to speak with tolerable certainty; but at the same time it must be borne in mind that instances come under notice from time to time, in which the most careful and experienced observers would be unable, *from a microscopical examination alone*, to decide positively as to the *nature* of the tumour" ("The Microscope in Medicine," by Dr. L. S. Beale).*

Many reasons surround the *history* (alike of Bursatti and Canker), wholly irrespective of the *microscopic view* which may be

* "I believe that the best histologists, when they contemplate the first textural beginnings of a cancer-growth in any affected organ, see only such simple signs of textural overgrowth as might equally be the beginnings of a non-infective tumour." . . . . "It seems that cancers have not, as was pretended, any one structure common to them." . . . . "On the whole, the anatomy of cancers is rather negative than positive in its bearings." (Dr. J. Simon, C.B., F.R.S., "On Cancer.")

taken of the nature of the diseases as being cancerous. The peculiar onset and insidious course of each, their malignant* tendency, the property they possess of secondarily involving internal organs, the peculiar pathological lesions they slowly induce, their liability to recur *in loco* when once they have been apparently eradicated, the total absence of pyrexia in the course of these two diseases, the absence of true suppurative changes in the lesions induced by them, the inoperative influence of the disease-products upon secondary "hosts," the characteristic cachexia of the later stages, the onslaught waxing equally severe on animals inordinately strong as on the thin and weakly, are corroborative evidences of the fact enunciated, that both these diseases are cancerous—evidences to which the most reluctant alienist must one day give adequate countenance.

Pathological Anatomy of Kunkur.

Histology—Mode of formation (definition)—Chemistry—Negative characters.

What is a kunkur? is an all-important question. I therefore wish to study this subject from four separate centres; viz.—1. The histology of kunkur. 2. The mode of its formation, or physiology of kunkur. 3. The chemistry of kunkur. 4. And the negative characteristics of kunkur. We shall then see that *a kunkur* is a substance worthy of the highest scientific attention.

For the sake of description I shall speak of it throughout as the embryonic (soft) and the mature (hard) kunkur, although, as we shall presently see, they are both but different stages of morbid change.

1. *Histology of Kunkur.*—I shall first describe (*a*) *what a kunkur is,* and then you will better understand (*b*) *what it is not.*

(*a*) This resolves itself into—

(1) *Histology proper of kunkur.*
(2) *Mode of formation of kunkur.*

(1) When a section of an *embryonic kunkur,* made with the

* Malignancy, note, does not necessarily mean the implication of neighbouring lymphatic glands. Often the lymphatics are free where the system is thoroughly charged with the disease-products. And in this I receive material corroboration by statistics drawn by "human" surgeons on Cancer.

main section, is placed under the miscroscope, it shows *sub* or *endo-kunkurs*, numbering two, three, or more, embedded in an immensely condensed hyaline or slightly fibrillated and granular matrix. On carefully working the fine adjustment, or causing pressure on the glass, each *sub* or *endo-kunkur* presents the exact characteristics of the *parent kunkur*, that is, it is seen to contain in its very centre cells which have undergone extreme compression, are degenerated and broken down, and around which are concentrically arranged spindle-shaped cells, some of which have been converted into fibres—all constituting a nest-like appearance. This is very roughly shown in fig. 11, the matrix being represented somewhat diagramatically.

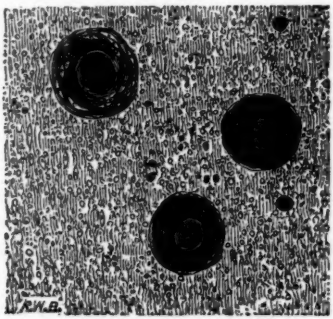

Fig. 11.

(2) A kunkur may be defined to be *the ultimate result (product) of an augmented endogenous cell-growth in a part the seat of an applied stimulus of a peculiar degree.* And I venture to define this peculiar degree of stimulus as being of a nature something below that producing true inflammation, yet resistant and continued in its action. The stimulus in the case of Bursatti being afforded by the sting of a fly, similar to that afforded by a hot pipe and soot in the case of Cancer occurring in the human subject, or to that occasioned by pricks from nails and by dirt in the foot of the horse in the formation of Canker.

Some few cases of Bursatti, however, may arise independently of the irritation produced by flies, similarly as Cancer in the human patient arises *usually* (for Dr. B. Moseley has shown that Cancer

among the natives of the West Indies is due to the sting of a fly common to those islands) from irritation other than that of flies. Simple ulcers and weakly cicatrices, in this country (Britain), we know, sometimes assume cancerous characters. The same we know of Bursatti occurring in India.

In the production of Canker in the foot of the horse, traumatic lesions afford an easy channel for the conveyance of foreign matters to the deep structures of the foot, which undergoing putrefaction dissolve away the opposing structures by chemical action, and thus expose a yet wider surface for the exertion of irritant action consequent on renewed deposits of extraneous matter. And thus a process of continued irritation is surreptitiously maintained, which being the food of Cancer, the change peculiar to it thence receives its first impulse. Foreign matters lodged on once denuded raw surface continually "make head," so to speak, into still deeper structures, in virtue of the chemical action they set up by their own decomposition. As a preventive of the disease, the necessity of keeping the cleft of the frog clean and dry is also loudly called for.

So ardent a believer in the *local origin theory of Cancer* was Dr. Carpenter, that he almost succeeded, more than once, in experimentally inducing the disease on otherwise healthy epithelium of man.

"The real efficacy of soot as a cause of Cancer is, perhaps, best shown by the fact that persons who have been long in the habit of handling it are very liable to get Cancer in the hands; and the number of chimney-sweeps who become affected with this disease is vastly greater in proportion to their own body than that of other men" (Dr. Wm. Budd, "On the Causes of Cancer").

To resume the subject of histology of kunkur. From a markedly increased nucleated and granular appearance being presented by the cells, we have been led naturally to infer that there must be an augmentation in the multiplication of the cells endogenously going on to give rise to such an exaggerated appearance; which, thus far known, much of the remaining phenomena at work in the production of a kunkur becomes easy of calculation. Thus A is a field for demonstration; the spot B, a cell in its interior; any continued stimulus at work in B occasions

an outward expansion, and consequent pressure on the surrounding structures, C. The result is that the immediately adjacent structures around B are receiving, as it were, successively galloping compressions in their integral composition ; thus, as it were, becoming ultimately packed in successive laminæ around the part, radiating from the centre—completing the entire phase of a kunkur. This process going on simultaneously at different centres in a part, the result is that *weight* is brought to bear on the forces (peripheries) at each centre, which occasions a resultant compression in the interior of the growing centres, and produces subsequent breaking up (degeneration) of their constituents, the cellular elements. The nutrition of the part being thus "cut off" by the resultant pressure on the peripheries of each centre, the subsequent effect is fatty or caseous metamorphosis—constituting "soft kunkur"—of, followed by calcareous change—constituting "hard kunkur"—in, such centres.

But the force at play in the formation of *sub* or *endo-kunkurs* is wanting further elucidation. We have for our demonstration three cells, A, B, and C, enclosed within an applied stimulus. The course of the stimulus is perhaps (say) more concentrated towards C than towards its fellows A and B. There is, in a word, a greater augmentation in the endogenous development in C than in A and B. All three not working alike, the speed of C overtakes that of A and B, and the result is the production of fig. 3 and subsequently, by assimilation, of fig. 4.

I have now shown, diagramatically, the mode of development of a *parent kunkur*, and of *sub* or *endo-kunkurs ;* and there remains to be described the mode of endogenous development in each cell proper to Cancer (Bursatti and Canker).

Fig. 5 is a cell of which A is the cell-wall, B the nucleus, and C the nucleolus. The stimulus applied to the cell causes increase in bulk of C, which as it grows bursts B, and occasions *d*; *d* receives a cell-wall, *e*, from condensation of the protoplasm (cell-content) D ; *d* in turn increases and ruptures *e*, and occasions *f*, and *f* in its turn 3. And thus 1, 2, and 3 are set simultaneously a-going, and the result is the production of that condition of the cell which is characteristic of Cancer.

To acquire an intimate knowledge of the nature of "kunkur,"

it is necessary that its section be examined in connection with the parent section. Those desirous of observing one will find a good engraving of it in Dr. Green's "Morbid Pathology," page 193, and several others of lesser interest on page 194. These represent but an incomplete stage of their development. It must be borne in mind, however, that we must not expect to find them here shown in the matured state to be seen in Cancer of the equine race. We recognise in the results of clinical experience an "ossific? (calcific) diathesis" peculiar to the equine tribe, which explains to us the ready and abundant deposition of calcareous matter taking place in newly-forming structures, etc. This accounts for the "human" surgeon being ignorant of the existence of such a thing as "kunkur" (as it occurs in the horse) in connection with the cancerous sores of his patient.

I have thus built up the entire "kunkur" from the first to its last stage, and so finished the consideration of heading (*a*).

Having shown *what a kunkur is*, it will now, therefore, be easier to explain *what it is not*. But before entering into this part of the subject, let us first inquire into the

3. *Chemistry of Kunkur.*—It is some years back now that Inspecting Veterinary Surgeon J. J. Meyrick, M.R.C.V.S., Superintendent of Studs in the Punjab, had first thought of investigating into its composition, and for this purpose had taken samples of it in large quantity from Mr. J. Burke, when in the late studs of Bengal. But the chemist to whom he submitted it was unable to give its exact composition, and since that time, so far as I know, no further successful endeavours have been made to identify the *true nature* of its component parts. Some time during sessions 1878-79 I submitted a quantity of "kunkur" to Mr. Shearer, of Edinburgh, for analysis, and he afforded me the following information:—

"1. A kunkur when heated on platinum foil fuses to almost an insignificant quantity of ash.

"2. It is calculated to contain about 90 per cent. of organic to about 10 per cent. of inorganic matter.

"3. The ash when tested shows the presence of phosphoric acid and lime (phosphates of lime)."

The carbonate of lime ($Ca\ CO_3$) that must also have formed

one of its constituents has, by heating on platinum foil, been split up into lime (Ca O) and carbonic acid (CO_2).

No other structure in the whole animal frame, save enamel, dentine, and bone, being found to contain more than, or as much as 10 per cent. of inorganic matter, we may safely assume that the kunkurs have become the seats of calcareous (inorganic) deposition. "This change reminds us of what takes place in the cacoplastic deposits in the coats of arteries and on serous membranes, constituting what is erroneously called *ossification.* The calcareous conversion of tubercles can be explained only on the supposition that the organic matter is absorbed, and the earthy salt is deposited in its place. This is exactly like what takes place in true petrifaction of organised bodies, the silica or calcareous substance being substituted molecule for molecule; so that, when all is converted into stone, the shape of the organised body is retained. And we further learn from this that the animal matter of tubercles may be absorbed" ("Principles of Medicine," by Dr. C. J. B. Williams).

(*b*). The negative characters of kunkur have been considered under heads of—Western, Hodgson, Phillips, and Meyrick, in the VETERINARY JOURNAL for October, 1880, to which the reader is referred.

THE *DISTOMA HEPATICUM* IN THE LUNGS OF CATTLE.

WE have carefully examined portions of lung-tissue obtained from cattle and containing "flukes," recently forwarded by Mr. Hedley, and we are now in a position to corroborate what he has described in the VETERINARY JOURNAL for June and July.

It would appear that the fluke in the "pupa" stage, having gained its *habitat* in the lung, sets up local irritation and inflammation, followed by exudation, suppuration, and the formation of cavities; whilst the neighbouring interstitial tissue becomes thickened, indurated, and finally calcareous salts are deposited in it, forming a hard, brittle wall to the cavity. The size of the cavity and the brittleness of its walls depend, as Mr. Hedley

says, upon the length of time it has existed. The cavities contain a thick, brown, gelatinous fluid, which, under the microscope, appears to be composed of the excretions and ova of the distoma, together with degenerated inflammatory products, and in all probability degenerated distomata.

Mr. Hedley asks how the parasites obtain access to the lungs. This is a difficult question to answer. It has been much debated how they gain access to the liver; and just as there are three possible channels for them to enter that gland, so there may be the same for them to penetrate to the lungs—viz., 1, by entering the hepatic duct to the liver, and the air-passage to the lungs; 2, by boring their way from the alimentary canal to the liver or the lungs; 3, by means of the circulation, or by two or all of these modes combined.

It is generally admitted at the present time that the fluke embryo gains admittance to the liver through the hepatic duct. If this circuitous course is accepted as the correct one, and that the creature does not bore its way through the tissues, then we can scarcely admit that it bores its way through to the lung. We must therefore find some more direct passage. This could occur in two ways—viz., 1, by the embryos being inhaled in a comparatively dry state, and when brought into contact with the warm moist mucous membrane regaining their full vigour and movements; 2, by adhering to the mucous lining of the fauces after being carried there with the food (this is not so likely to occur with the water, as it is swallowed too rapidly), and thence conveyed to the bronchial tubes and air-cells during inspiration, or by their own peculiar movements. The latter is not very probable, since the irritation they would occasion in the larynx would produce coughing, and consequently their expulsion. Again, whether during inspiration moist particles adhering to the walls of the passages can be carried along is extremely doubtful.

To what extent the embryos can resist the desiccating process does not appear to be definitely known. It seems highly probable, however, that there may be a condition in which they are sufficiently dry to be carried by a breeze, retain their vitality, and regain their activity when brought into contact with a moist

warm surface. If this latter is actually the case, we may then understand how it is that the lungs of cattle are more frequently attacked than the lungs of sheep. Cattle inhale air much more energetically than sheep, and this would consequently be more likely to carry small particles with it. Their air-passages, too, are larger, and therefore receive more air, and proportionately more embryos, and the latter would not be so likely to lodge against the walls of the air-passages. On the other hand, it may be said that sheep feed much closer to the ground, and therefore would be more likely to inhale the embryos. It is, however, a fact that the lungs of both animals are occasionally the *habitat* of the *Distoma Hepaticum*.

Few believe, at the present day, that the distomata gain admittance to the liver by boring through the alimentary canal, peritoneum, and capsule of the liver. If this were the case, some traces of their migration would necessarily be found; but it is not so. Nor is it thought that they bore their way through the walls of the intestine into the mesenteric vessels, and then into the liver.

The majority of observers consider that the fluke embryo gains access to the liver through the hepatic duct (see VETERINARY JOURNAL, vol. x., p. 250, where this is fairly argued out in a paper by Professor Friedberger, of the Munich Veterinary School), and not by piercing the walls of the alimentary canal, peritoneum, and capsule, to gain the liver. Farther on in the same article the reader will find that those who uphold this theory assert that the embryo may pierce the hepatic duct, and gain admission to the parenchyma of the liver, the peritoneal cavity, and even into the portal and hepatic veins. From the latter they may be carried by the blood current into the right heart, and thence into the lungs by the pulmonary artery, producing embolism and cysts. Surely there must be something illogical in these assertions. In the first place, their propounders do not admit that the fluke pierces the alimentary canal, but that they do so after they have gained the liver by the hepatic duct; then they bore their way into the vessels. We, however, do not see why, if the parasite bores at all, it may not bore its way into any tissue

(except, perhaps, bone and cartilage). But in answer to this, we are told, no traces of their passing through the walls of the intestine have been discovered, whereas they have been seen (?) piercing the walls of the vessels.

Leukart, who thinks they gain access to the lungs by means of the blood current, also believes that the distoma could gain access to the most distant parts of the body by means of both *venæ cavæ*,* and cause abscesses in such parts. Such peripheral abscesses, however, have, up to the present time, only been seen in the human subject. If we were quite certain that there were "fluke abscesses," the subject would appear to be settled; but we think more evidence is required before we can look upon the matter as finally disposed of.

Again, from the anatomical characters of the parasite, it does not appear to possess the power of boring through membranes, except, perhaps, immediately after leaving the egg-shell. At this stage it is said to be provided with a horny spine, which, by-the-bye, from the drawings we have seen, does not appear to be adapted for that purpose at all, but rather of holding on to the host, viz., molluscs, which are very soft creatures, and consequently require but little force on the part of the sporo-cyst to enter their bodies. If they do gain entrance to the blood-vessels at all—about which there seems to be little doubt—we are inclined to think they do so by the degenerative changes they occasion in the liver, and not by boring their way into them. If the theory be accepted of the liver being infested through the *hepatic duct*, we would suggest that the analogous theory of the lungs becoming affected through the *air-passages* be accepted, until more evidence can be given in favour of their gaining the pulmonary tissue by boring their way into the vessels, and being thence carried to the pulmonary arteries, etc.

If the "boring" theory be accepted, then it is difficult to explain why they are not found in other tissues than the lungs, and also why they are not more frequently met with in these organs. This, however, may be argued against to a certain extent, from the fact that the parasites, as a rule, have their

* If this be the case, they must travel against the blood flow in the post vena cava.

particular hosts, and peculiar locality in that host for their development, and that only under very exceptional circumstances —which we are not in a position to explain—do they deviate from this course.

THE EFFECTS OF LIGHTNING ON ANIMALS.

BY R. KNOWLES, M.R.C.V.S., WISBEACH.

As Mr. Banham has recently been the means of bringing before our notice some valuable information relative to the "Effects of Lightning on Animals," and as the amount of general information on this subject is so very scanty, I think the following particulars of two cases that have lately occurred in my practice might be of some interest to the readers of the VETERINARY JOURNAL.

On the evening of June 6th, I was sent for to see a valuable two-year-old thoroughbred colt that had suddenly been taken very ill. Being unable to go myself, I sent my assistant, who, on his arrival, found the animal to be affected with Tetanus. I saw the colt myself the next morning and gained the following information respecting him. He had been turned out in a field near the farm, and had been in perfect health up to twelve o'clock on the previous day, never having met with any accident or received any injury.

He was then observed standing with another colt under some trees during a violent thunderstorm, and he was not seen again till three o'clock in the afternoon, when it was noticed that there was something amiss with him, and on going to him the owner found that he was "stiff all over." I could discover no surface markings of any kind on the body; but from the history I had no doubt that the cause of the Tetanus was shock to the nervous system, produced by the lightning. He was in such a dreadful state that I advised the owner to have him destroyed.

As I was leaving the yard, my attention was drawn, by one of the men, to the fact that the other colt (also a thoroughbred two-year-old), with which the affected one had been, seemed very excited and was running about all over the strawyard; but I thought nothing of this, as I attributed the cause merely to the

separation from his companion. The next day the owner called to see me, and said that the second colt seemed all right in himself, but they had noticed two or three places about him which looked as if they had been singed. I heard nothing more of him till the morning of the 19th June, when a messenger came to say that the colt which was singed had been taken like the other one. I went off to see him at once, and on my arrival I found him to be affected, not with Tetanus, but with Paraplegia, and I came to the conclusion that this also was the effect of the storm, although a fortnight had elapsed since this took place. I gave the owner very little hopes of the animal's recovery, but I am glad to say that the case is yielding to time and treatment, and the animal is making very satisfactory progress. The principal treatment has consisted in the administration of strong doses of Nux Vomica combined with Ferri Sulph.

Editorial.

THE TITLE OF VETERINARY SURGEON AND THE VETERINARY SURGEONS' BILL.

SINCE the obtainment of the Charter of incorporation in 1844, the members of the Royal College of Veterinary Surgeons have indulged in the belief that the title of Veterinary Surgeon conferred upon them by the said Charter was exclusively their own. We, ourselves, have firmly entertained that opinion, and more than once have acted upon it; and that no one had any right to assume it, was the one reason why we have moved most energetically for several years in arousing the profession to obtain an Act of Parliament to make it a penal offence for any one to adopt it who was not a graduate of the Royal College. And this it was which impelled us last year to take active measures for procuring legislative interference, and to have a Bill drafted which would exclude all persons, save members of the profession, from designating themselves Veterinary Surgeons.

When that Bill, the progress of which we reported in last month's Journal, reached the Government, we were destined to a rude awakening from our dream, as those who were in the best position of all others to decide, asserted most emphatically that the exclusive right to the title did not belong to us. It was in vain we pointed out that it was introduced with the establishment of the first Veterinary School, and had always been our special designation, and that the Charter acknowledged this. The reply of the Government officials—and they were one and all anxious to favour the profession—was that a charter could not confer an exclusive right to the title, inasmuch as it could not prevent or punish

any one adopting it—for this an Act of Parliament is necessary; that though non-qualified men had assumed the title previous to 1844, no steps were taken by the Royal College in that year, nor since, to deprive them of it or restrain others; and that therefore men who had assumed the title of Veterinary Surgeon could not be punished for doing so, as there was no law to punish them; while it would be most unjust and cruel to deprive them of a designation which it was consequently decided was not illegal to adopt.

Added to this decision was the action of the unqualified men all over the country, who, on learning the purport of the Bill introduced into the House of Lords by Lord Aberdare, took immediate steps to protect themselves from injury. Then came the Highland and Agricultural Society of Scotland, which, after all the concessions made by the Royal College, and after rescuing it from a painful, if not a ludicrous position, opposed the Bill on behalf of its certificate-holders (as will be seen from the reports in last and this month's Journal), and would doubtless gladly have had it thrown out altogether, did it possess the power. Thus we had, on the one hand, the unqualified men and the Highland Society pitted against the profession, very many of whose members had been holders of the Society's certificate and whom it thus opposed; and, on the other hand, the legal advisers of the Privy Council, who were confident that Parliament would and could never pass the Bill as presented by Lord Aberdare. The Lord President of the Privy Council, than whom the veterinary profession in these kingdoms never had a better friend, or one more anxious to rescue it from its present degraded position, then undertook to amend the Bill in such a way as to give us all the privileges possible without compromising its safety in passing through both Houses of Parliament. The profession will possibly never know the amount of anxiety, consideration, and trouble the amended Bill required. The exclusive right to the title of Veterinary Surgeon we could not legally or morally claim; for though we are not aware what the promoters of the Charter of 1844 really expected when it was obtained, it is certain that when the ever-to-be-lamented disruption took place with the Edinburgh Veterinary School soon after, the profession was paralysed, so far as protecting its members was concerned; as the Highland Society would most undoubtedly have opposed, as it has now in conjunction with the pretenders opposed, any attempt to make the title the exclusive property of the Royal College graduates. Thus the Society became indirectly the protector of the impostors, and under its ægis these have flourished, multiplied wondrously, and waxed strong. This fact we commend to the reflecting faculties of those who are never tired of praising the Society for what it has done for veterinary science in these kingdoms, and who roundly and soundly abuse those who venture to doubt whether, after all, the Society's wholesale interference in veterinary affairs has been an unmixed blessing, especially of late years.

Earl Spencer succeeded in carrying his most important amendment—a retrospective period of five years, during which the unqualified man must have been in practice continuously, and then his admission to a separate register was to be a question for the consideration of the

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Council of the Royal College; in fact, this and other important matters were left in the hands of the Council. This concession appears to be a great one, when we bear in mind that in 1815 the Royal College of Surgeons had, up to the passing of their Act, to admit on their register every unqualified person who had ever performed the most trifling operation, or medical or surgical duty. It was the same with the chemists, and still later it has happened to the dentists.

An Act of Parliament was passed in July, 1878, entitled "The Dentists' Act," which required that every one who commenced practice as a dentist, *after that date*, should fulfil a curriculum of medical, surgical, and dental studies, and submit to examination for the diploma of "Licentiate in Dental Surgery" of one of the medical colleges.

This legislation was rendered imperatively necessary in order to protect the public, provide competent dental practitioners, and to stop the continual and enormous influx into the profession of men who, neither by previous training nor education, possessed the smallest claim to the title of dentist.

This Act, however, could not interfere with the incompetent and unqualified dentists already in practice, beyond requiring them to register; and on their fulfilling this condition they were allowed to continue as they were.

The following particulars will show that being "Registered by Act of Parliament" is no proof of qualification or professional skill as far as the present generation of dentists is concerned, unless the practitioner holds the "Dental Diploma" of a medical college in addition to the Registration Certificate.

Every one who called himself a dentist, whether qualified or not, was compelled to register before August 1st, 1879; the conditions for registration being simply the payment of the required fee and the filling up of a declaration stating that the applicant had been in *bonâ fide* practice as a dentist, either separately or in conjunction with the practice of medicine, surgery, or pharmacy, before July, 1878.

5,289 persons placed themselves on the register as being in *bonâ fide* practice as dentists, and were classed as follows:—

Licentiates in Dental Surgery of various Medical Colleges, or qualified dentists	483
Physicians and surgeons practising dentistry	50
Dentists without diplomas or qualification	2,707
Chemists and chemists assistants as dentists in conjunction with the pharmacy	2,049
	5,289

Any of the registered are entitled to make use of such titles as Registered Dentist, or Registered Surgeon Dentist by Act of Parliament, or Dentist certified by the Medical Council, etc., etc.; but no one but a qualified dentist can place the letters L.D.S. after his name, and signify that he is a "Licentiate in Dental Surgery" of any medical body, without laying himself open to prosecution and punishment.

We append the Veterinary Surgeons' Bill, in order that, in clauses 15, 16, 17, the advantages we are offered may be compared with those given to other professional bodies when they were first recognised by Act of Parliament. The other great advantages in the preceding clauses are obvious, and especially those contained in clauses 6 and 14. What is to be particularly noted is, that from the passing of the Act the proper title of M.R.C.V.S., which has been assumed by many impostors, is to be dropped at once by them and restricted to graduates of the Royal College; a year is allowed for the registration, in a separate register, of those unqualified men who have been in practice for five years, and whom the Council of the Royal College chooses to admit, under the head of "existing practitioners"—*i.e.*, the further adoption of the title of Veterinary Surgeon by such men ceased five years ago; in two years quackery and imposition cannot exist. We say nothing of the recognition of the Royal College as a body incorporated by Act of Parliament, and for the first time in its existence a perfectly legalised body, enjoying that protection and advantages which similarly constituted bodies, as the Royal College of Surgeons, enjoy.

On the solicitation of the President of the Royal College, the Right Hon. A. J. Mundella, Vice-President of the Privy Council, undertook charge of the Bill in the House of Commons, as at the late period of the session and the great press of business yet on hand a private Member would have no chance of getting it through; and even now if it is opposed, be the opposition of the most trivial character, it runs great danger of not passing, as there is no time to get rid of opposition before Parliament rises. We trust, however, that this may not be so, as the present is an opportunity we shall never again have to get rid, once and for ever, of the terrible incubus which has, for nearly forty years, paralysed and all but ruined us. We hear rumours of opposition to the progress of the Bill, and by members of the profession too; but we can scarcely credit them, though if true it would only be another illustration of the painful truth, that the very worst enemies of the profession have ever been found in its own ranks. Envy, malice, and hatred would be a far more appropriate motto for our corporation than the one it now has, and which must have been given to it in very derision and mockery. "Against stupidity the gods themselves contend in vain." When this stupidity is conjoined with treachery, very slight regard for veracity, duplicity, and all the other defects which mar the reputation of a certain class of mankind, then contention is indeed hopeless.

The following is the Bill as it passed its second reading in the House of Commons on July 18th :—

A BILL INTITULED AN ACT TO AMEND THE LAW RELATING TO VETERINARY SURGEONS.

Whereas it is expedient that provision be made to enable persons requiring the aid of a veterinary surgeon for the cure or prevention of diseases in or injuries to horses and other animals, to distinguish between qualified and unqualified practitioners :

Be it therefore enacted by the Queen's Most Excellent Majesty by and with the advice and consent of the Lords Spiritual and Temporal and Com-

mons in this present Parliament assembled and by the authority of the same as follows:

Short Title. 1. This Act may be cited as the Veterinary Surgeons Act 1881.

Interpretation. 2. In this Act—

"The Royal College of Veterinary Surgeons" means the Royal College of Veterinary Surgeons incorporated and regulated by a Charter and two Supplemental Charters granted by Her Majesty in the years 1844, 1876, and 1879 respectively.

"The Registrar" means the Registrar for the time being of the said Royal College.

"Veterinary surgery" means the art and science of veterinary surgery and medicine.

Provisions as to register of Veterinary Surgeons. 3. (1) The register of members of the Royal College of Veterinary Surgeons directed by Her Majesty's said Royal Charter of 1876 to be made and maintained, shall be styled the Register of Veterinary Surgeons, and shall be kept as accurately as possible by the registrar.

(2) The Council of that College shall cause correct copies of the said register to be from time to time and at least once a year printed under their direction and published and sold, and such copies shall be admissible in evidence.

Provision for examination of students in Scotland. 4. The Royal College ot Veterinary Surgeons shall be bound to make provision in the manner permitted by their Charters for the examination in Scotland of the students attending the several Scotch Veterinary Colleges, and to admit and register such students as have passed the examination as members of the said Royal College under the provisions of such Charters and this Act.

Correction of register. 5. (1) The registrar shall from time to time insert in the register of Veterinary Surgeons any alteration which may come to his knowledge in the name or address of any person registered.

(2) The registrar shall remove from the said register the name of every deceased person.

(3) The registrar may remove from the said register the name of a person who has ceased to practise, but not (save as hereinafter provided) without the consent of that person.

(4) Where the registrar has reason to think that any person registered has ceased to practise, the registrar may send by post to such person a notice inquiring whether or not he has ceased to practise or has changed his residence; and if the registrar does not within three months after sending the notice receive any answer thereto from such person, the registrar may within fourteen days after the expiration of the three months send him by post in a registered letter another notice referring to the first notice, and stating that no answer thereto has been received, and if the registrar does not within one month after sending the second notice receive any answer thereto, such person shall for the purpose of the present section be deemed to have ceased to practise, and his name may be removed accordingly.

(5) In the execution of his duties the registrar shall act on such evidence as in each case appears sufficient.

Removal of name from register. 6. The power conferred by the said Supplemental Charter of 1876 on the Council of the said Royal College, at a meeting of the Council, at which not less than two-thirds of the members are present, and with the consent of three-fourths of the members so present, but not otherwise, to remove a name from the register of Veterinary Surgeons may be exercised in respect of any person who is at the passing of this Act on that register, or who is after the passing of this Act placed thereon under

the said Charters or this Act, but in the following cases only (that is to say), at the request or with the consent of the person whose name is to be removed, or where a name has been incorrectly entered, or has been fraudulently entered or procured to be entered, or where a person registered has, either before or after the passing of this Act, and either before or after his registration, been convicted, either in Her Majesty's dominions or elsewhere, of an offence which, if committed in England, would be a misdemeanour or higher offence, or where a person registered is shown to have been guilty, in Her Majesty's dominions or elsewhere, of any conduct disgraceful to him in a professional respect.

Restoration of Name to Register.

7. (1) Where the Council of the said Royal College have removed the name of any person from the register of Veterinary Surgeons, the name of that person shall not be again entered in the register except by a resolution of the Council passed under this section, or by order of a court of competent jurisdiction.

(2) The Council may by resolution passed by a like proportion of their number as is for the time being required for the removal of a name from the said register, direct the registrar to restore to the register any name removed therefrom, either without fee or on payment of such fee not exceeding the registration fee, as the Council from time to time fix, and the registrar shall restore the same accordingly.

(3) The name of any person removed from the said register at the request of such person or with his consent shall, unless it might if not so removed have been removed by order of the Council, be restored to the register, on his application and on payment of such fee not exceeding the registration fee as the Council from time to time fix.

Proceedings for removal or restoration of name.

8. (1) The Council of the said Royal College shall, for the purpose of exercising in any case the power of removing a name from or of restoring a name to the register of Veterinary Surgeons, ascertain the facts of the case by a committee of the Council, the powers of the committee being exercisable by not fewer than three members of the committee; and the report of the committee, after hearing the person concerned, if he so desires, shall be for the purpose aforesaid conclusive as to the facts, but so that the Council shall form their own judgment on the case independently of any opinion of the committee.

(2) If in any case the Council determines to remove the name of any person from the register of Veterinary Surgeons, or refuses to restore thereto the name of any person, the Council shall, if required by him, state in writing the reason for that determination, and he may appeal to the Privy Council; and the Privy Council, after communication with the Council of the said Royal College and the appellant, may either dismiss the appeal, or order that Council not to remove the name of the appellant, or to restore his name, as the case may require.

Evidence of Registration.

9. A copy of the register of Veterinary Surgeons for the time being purporting to be printed and published in pursuance of this Act shall be evidence in all cases (until the contrary be made to appear) that the persons therein named are on the register of Veterinary Surgeons; and the absence of the name of any person from such copy shall be evidence (until the contrary be made to appear) that such person is not on that register: Provided that in the case of any person whose name does not appear in such copy a certified copy under the hand of the registrar of the entry of the name of such person in the said register shall be evidence that such person is on the register.

Notice of Death of Practitioners.

10. Every registrar of deaths in the United Kingdom on receiving notice of the death of any person on the register of Veterinary Surgeons, shall forthwith transmit by post

to the registrar a certificate under his hand of such death, with the particulars of time and place of death, and may charge the cost of such certificate and transmission as an expense of his office.

Penalty on Obtaining Registration by false representation.

11. Any person who wilfully procures or attempts to procure himself to be placed on the register of Veterinary Surgeons by making or producing or causing to be made or produced any false or fraudulent declaration certificate or representation either in writing or otherwise, and any person aiding and assisting him therein shall be deemed guilty in England or in Ireland of a misdemeanour and in Scotland of a crime or offence punishable by fine or imprisonment, and shall on conviction thereof be liable to a fine not exceeding fifty pounds or to be imprisoned with or without hard labour for any term not exceeding twelve months.

Penalty for wilful falsification of register.

12. If the registrar wilfully makes or causes to be made any falsification in any matter relating to the register of Veterinary Surgeons he shall be deemed guilty of a misdemeanour, and shall be liable to a fine not exceeding fifty pounds, or to be imprisoned with or without hard labour for any term not exceeding twelve months.

Registration of colonial or foreign practitioner with recognised diploma.

13. (1) Where a person shews that he holds some recognised veterinary diploma granted to him in a British possession, and either that the grant of such diploma occurred when he was not domiciled in the United Kingdom, or in the course of a period of not less than five years during which he resided out of the United Kingdom, or, if he was practising veterinary surgery in the United Kingdom at the passing of this Act, that he has practised veterinary surgery for not less than ten years, either in the United Kingdom or elsewhere, he shall upon payment of the registration fee be entitled without examination in the United Kingdom to be registered as a colonial practitioner in the register of Veterinary Surgeons and to become to all intents a member of the said Royal College.

(2) Where a person shews that he obtained some recognised veterinary diploma granted in a foreign country, and either that he is not a British subject, or, that if a British subject he has practised veterinary surgery for more than ten years elsewhere than in the United Kingdom, or if he was practising veterinary surgery in the United Kingdom at the passing of this Act for not less than ten years, either in the United Kingdom or elsewhere, and either continues to hold that diploma or has not been deprived thereof for any cause which disqualifies him for being registered under this Act, he shall, on payment of the registration fee, be entitled without examination in the United Kingdom to be registered as a foreign practitioner in the register of Veterinary Surgeons and to become to all intents a member of the said Royal College.

(3) For the purposes of this section a veterinary diploma is any diploma, licence, certificate, or other document granted by any university, college, corporation, or other body in respect of veterinary surgery, and includes a licence or authority to a person to practise veterinary surgery granted by any department of or persons acting under the authority of the government of the country or place within or without Her Majesty's Dominions wherein the licence or authority is granted; and a British Possession is any part of Her Majesty's Dominions out of the United Kingdom; and a recognised veterinary diploma is a veterinary diploma recognised for the time being by the Council of the said Royal College as furnishing a sufficient guaranty of the possession of the requisite knowledge and skill for the efficient practice of veterinary surgery, and as entitling the holder thereof to practise veterinary surgery in the British Possession or foreign country wherein the diploma was granted.

(4) If a person is refused registration as a colonial practitioner, or as a foreign practitioner, the Council of the said Royal College shall, if required by that person, state in writing the reason for that refusal, and if that reason be that the veterinary diploma held or obtained by him is not a recognised veterinary diploma, that person may appeal to the Privy Council, and the Privy Council, after communication with the Council of the said Royal College and the appellant, may either dismiss the appeal or order that Council to recognise that veterinary diploma.

Confirmation of Charters.

14. The said Charters of the Royal College of Veterinary Surgeons are hereby confirmed, and are declared to be and shall be in full force and virtue, except as far as the same are by this Act altered, or as the same are inconsistent with this Act, but not so as to prevent the making of any amendment thereof or addition thereto by any supplemental Royal Charter not being inconsistent with this Act.

Title of existing veterinary practitioners to be registered in College.

15. (1) Where at the passing of this Act any person practises and has continuously for not less than five years next before the passing of this Act practised veterinary surgery in the United Kingdom,* but is not on the register of Veterinary Surgeons, he shall be entitled, subject to the provisions of this Act, to be placed on that register, without examination, on such terms as to payment of fees, and as to other matters, as the Council of the said Royal College, with the approval of the Privy Council, directs.

(2) On any person applying for registration under this section within one year after the passing of this Act, and thereupon, or within a reasonable time thereafter, producing to the Council of the said Royal College evidence of his title to registration by statutory declarations of himself and of other persons able to testify on his behalf, or such other evidence as that Council reasonably requires, he shall be registered under direction of that Council accordingly.

(3) If a person is refused registration under this section the Council of the said Royal College shall, if required by him, state in writing the reason for that refusal, and he may appeal to the Privy Council; and the Privy Council, after communication with the Council of the said Royal College and the appellant, may either dismiss the appeal or order that Council to register the appellant under this section.

(4) The names of the persons registered under this section shall be placed in a separate division of the register of Veterinary Surgeons under the heading "existing practitioners," but no such person shall be deemed to be a member of the said Royal College within the said Charters or this Act.

Penalty on false representation as to membership of college.

16. If after the passing of this Act any person not being a Fellow or a Member of the Royal College of Veterinary Surgeons takes or uses any name, title, addition, or description, by means of initials or letters placed after his name, or otherwise, stating or implying that he is a Fellow or a Member of the Royal College of Veterinary Surgeons, he shall be liable to a fine not exceeding twenty pounds.

Penalty on misrepresentation after 1883 as to qualification to practise and incapacity to recover fee, &c.

17. (1) If after the thirty-first day of December, 1883, any person, other than a person who for the time being is on the register of Veterinary Surgeons, or who at the time of the passing of this Act held the veterinary certificate of the Highland and Agricultural Society of Scotland, takes or uses the title of Veterinary Surgeon or Veterinary Practitioner, or any name, title, addition, or description stating that he is a Veterinary Surgeon or a practitioner of

* At the request of the President R.C.V.S., Mr. Mundella consented to introduce the words here "under the title of Veterinary Surgeon."

veterinary surgery or of any branch thereof, or is specially qualified to practise the same, he shall be liable to a fine not exceeding twenty pounds.

(2) From and after the same day a person other than as last aforesaid shall not be entitled to recover in any court any fee or charge for performing any veterinary operation, or for giving any veterinary attendance or advice, or for acting in any manner as a Veterinary Surgeon or Veterinary Practitioner, or for practising in any case veterinary surgery, or any branch thereof.

Exercise of powers of Privy Council.

18. (1) All powers vested in the Privy Council by this Act may be exercised by an Order of Council made by two or more of the Lords and others of Her Majesty's Most Honourable Privy Council.

(2) An order made by the Privy Council under this Act may be made conditionally or unconditionally, and may contain such terms and directions as to the Privy Council seem just.

(3) The Council of the said Royal College shall forthwith obey any Order of the Privy Council under this Act, and observe and fulfil all conditions, terms, and directions therein contained.

Summary proceedings for fines and imprisonment.

19. Fines and imprisonment under this Act may be recovered and imposed summarily that is to say—

11 and 12 Vict. c. 43. — in England in manner provided by the Summary Jurisdiction Act 1848 and the Summary Jurisdiction Act 1879 and any Act amending either of those Acts;

42 and 43 Vict. c. 49. 27 and 28 Vict. c. 53. — in Scotland before the sheriff or sheriff-substitute or two justices in manner provided by the Summary Procedure Act 1864 and any Act amending the same;

14 and 15 Vict. c. 93. — in Ireland within the police district of Dublin metropolis in manner directed by the Acts regulating the powers and duties of justices of the peace for such district or of the police of such district, and elsewhere in Ireland before two or more justices of the Peace in manner directed by the Petty Sessions (Ireland) Act 1851 and any Act amending the same.

A prosecution under this Act may be instituted by the Council of the Royal College of Veterinary Surgeons but shall not be instituted by a private person without the written consent of the said Council.

THE ANATOMY AND PHYSIOLOGY OF THE THIRD STOMACH OF RUMINANTS.

(*Concluded from page* 41.)

THE anatomy of the part has taught us that the longitudinal muscular layer of the psalter wall is much less inconsiderable than the circular, which is often three or four times as strong and thick as the former. When, therefore, the walls of this stomach contract in toto, the effect must be a diminution in the transverse diameter; that is, the spaces between the leaves will become lessened, and the food contained therein pressed upon and broken down. Accompanying this contraction, there must of necessity be a movement of the leaves, especially of those whose warty papillæ have, from the muscular contraction, become stiff and firm. All these hardened processes are thus drawn like the prongs of a harrow through the cake-like masses of food.

In order to render this action still more energetic, the leaves become by the operation of the central muscular layer shortened in breadth, and consequently thickened and stiffened. Another result must be the closure of the

chambers. The closure, however, is not so complete as to prevent the escape of fluids; on the contrary, from the uneven surface of the leaves numbers of canaliculi are present, through which the fluid as it is pressed out by the contraction of the leaves finds its way. In this manner the alimentary matter loses moisture, becomes inspissated, and consequently more easily ground down.

The movement of the leaves is, moreover, *successive*, every portion of the outer wall not contracting simultaneously, but gradually, so that whilst one leaf is passing forward another is returning to its original position, *i.e.*, is moving in a contrary direction.

Inasmuch as these movements are almost constantly taking place, and the psalter is always in a certain state of contraction, the pulverization of the food must be continually going on. No reasonable doubt can therefore be entertained that the third stomach is a *triturating apparatus*, and well adapted to play the part of a mastication-stomach. A simple examination of the contents reveals this fact—the food in the abomasum end appears finer than in the anterior end (Haubner). Ocular demonstration is, however, not infallible—it may deceive. In order, therefore, to ascertain the truth of this view, Professor Ellenberger instituted a succession of experiments, the details of which appear in the original article. The results completely bear out the view that the psalter represents a mastication-stomach, whose function is the pulverization of the insufficiently chewed aliment. It ruminates, in fact, the non-remasticated food, and acts the part of a watchman in preventing such coarse materials reaching and irritating the sensitive mucous membrane of the fourth stomach.

The second, third, and fourth questions may be conveniently studied together. Owing to the expression of fluid by the leaves, and to gravitation of the same, the food in the lower portions of the chambers must be much richer in fluid constituents than that in the upper, that is in the neighbourhood of the greater curvature. A second set of experiments corroborated this view. The fluid passes under the influence of the above causes into the psalter groove, and thence to the abomasum.

One might regard these facts as sufficient to explain the exsiccation of the omasum contents, as well as the fact that they are always found to be drier than those of the other stomachs. Other explanations may, however, be offered to solve the latter fact. Haubner and others have already demonstrated that liquids and semi-liquids, such as gruel, may reach the abomasum without passing between the leaves, and undoubtedly the major portion of the pure fluids do take this course. A part may possibly be attracted by the dry masses into the chambers. From the above we therefore derive two facts, between which it is essential that we should distinguish.

1. That the food which arrives in the compartments of the third stomach is much poorer in fluid constituents than that which arrives in the other stomachs.

2. That a very considerable portion of the fluid which does reach the chambers is very soon pressed out again—pressed out again not only by contraction of its own walls, but also by pressure on the psalter by the rumen in rumination and by the diaphragm in respiration.

These facts will enable us to answer question No. 3. The query still remains, however, is the diminished fluidity accelerated by absorption by the psalter mucous membrane? and if so, to what extent? That it is in a position to absorb liquids there can be no doubt, but that it is particularly adapted or specially designed for this function, or that the psalter is an absorption-stomach, and as some have asserted an absorption-organ of extraordinary potency, we beg leave to doubt, and even to deny. If the anatomical characters of this membrane be borne in mind, the correctness of our asser-

tion will, we think, become perfectly apparent. Covered by several tolerably thick layers of plaster epithelium, firmly attached to the parts lying beneath, it is only some considerable time after death that the mucous membrane can be detached. Its epithelium, like that of the rumen, is but slightly permeable. Experiments with potassium hydrate revealed the resistant power of the epithelial cells. On pouring this reagent on to the mucous membrane, its epithelial layer was easily detached, but no quicker than that of the rumen. When we examined, however, the horny layer under the microscope its cells were observed to resist the action of the reagent for a considerable length of time, and especially those covering the apices of the papillæ. Artfiicial juices produced no effect whatever. In the reticulum half especially is the epithelial layer so thick, so firmly attached, and the summits of the horny elevations so considerable, that we are justified in regarding absorption as almost an impossibility.

Nor does the arrangement of the blood and lymph vessels resemble that found in an absorption-organ, but rather that of the skin. Both are, by virtue of the thickness of the epithelium, far removed from the surface.

But in order to substantiate this assertion, based only on anatomical facts, I deemed it again advisable to resort to experiment, and to this end the following methods suggested themselves to my mind. Firstly, to examine the omasum contents after the opening into the abomasum had been tied, in order to prevent the escape of fluids; secondly, to test the rapidity of absorption by injecting into a stomach, previously tied at both ends, a fluid coloured in such a manner that it could easily be recognized again in the blood; and lastly, to establish a fistulous opening with the abomasum end of the omasum, in order to ascertain the consistency of the mass as it left the third stomach.

The difficulty in carrying out these operations, as well as the apparent superfluity of the same, determined me to abandon the attempt, and to resort to other means, viz., to ascertain the diffusion capability of various animal membranes, and then to compare it with that of the psalter mucous membrane. From this I should be able to judge of the absorption capability of the latter, for the diffusibility of a membrane is always in proportion to its absorption capability.

Omitting details of these experiments, we pass on to notice the deductions which Professor Ellenberger draws therefrom. He says, These experiments show that the intestinal mucous membrane is far more permeable than that of either the first or the third stomachs, and that the psalter is slightly less permeable than the rumen. The diffusion of the solutions was always first noticeable through the intestinal mucous membrane. These conditions became, however, after a while reversed, and more fluid passed through the membrane of the omasum. It is then clear that the epithelium of this stomach offers a great resistance to the diffusion of fluids, and only when this layer has become permeated and softened does diffusion to any extent take place. Thus, whilst freshly obtained mucous membrane permitted the passage of only 0,08 grammes of sugar in thirty hours, 0,66 grammes passed through mucous membrane which had been previously macerated in warm water for twenty-four hours. The conclusion is therefore forced upon us that being permeated with such difficulty, the psalter mucous membrane cannot be regarded as a good absorbent medium.

I quite agree with Fürstenberg that fat molecules are to be found in the epithelium, but disagree with the deduction he draws, that they are derived from the contents of the omasum. I gave sheep with their usual food fat, fatty emulsions, and fatty emulsions strongly tinged with alcanna red, without being able to notice either any increase in the amount of fat in the cells or the presence therein of the coloured fat molecules.

As regards question No. 1, I may here remark that the results of my examinations are quite in accordance with those of all modern observers, viz., an entire absence either of glands or lymph follicles in the psalter mucous membrane. Further, no resemblance can be traced between its epithelium and that of secretory organs, although it must be acknowledged that the course of the blood-vessels is very similar. On anatomical and experimental grounds I must therefore answer this question in the negative. (Details given in original article.)

RESUME.

Reasoning from the preceding facts and experiments, we may arrange our conclusions as follows :—

1. *The psalter has no secerning function.*

2. Chemical digestive processes occurring therein are limited to the action of the saliva swallowed with the food, and to the decomposition processes.

3. *The psalter is a masticating stomach, a triturating, pulverizing apparatus.* Its action is more especially brought to bear on that portion of the food which has escaped rumination, and may even to some extent replace this function. It hinders the entrance of food into the abomasum which, but for its action, would irritate and injure the sensitive mucous membrane of that organ. It brings the food into such a finely divided state that the action of the digestive juice upon every part is greatly facilitated.

4. The psalter, being furnished with automatic centres, is in a position to carry out the above.

5. Its mucous membrane is anatomically *very unfavourably adapted for carrying on the function of absorption, imbibes with difficulty, and is but slightly permeable to the fluid nutritive materials. The exsiccation must therefore be due to some other cause than absorption of the fluid constituents of the food.*

6. Its contents are much drier than those of the other stomachs—a condition brought about by the operation of the following factors. The principal portion of fluids passes along the psalter groove direct to the abomasum, so that but little reaches the chambers ; the *loss of fluid* in the chambers is due *to the pressure brought to bear on their contents and to gravitation.* This gravitation or voluntary flowing away must just as certainly occur as it does in a semi-fluid mass placed on a filtering cloth. If we squeeze the cloth we increase the flow. *It is precisely the same in the psalter. The loss of water is essentially the result of pressure exerted on the cake-like masses of food by the contraction of the psalter walls,* aided by external pressure. The loss by absorption is but very trifling, and can only be considered of importance in cases where the food is retained for an abnormally long time in this portion of the digestive tract.

The purpose served by the exsiccation which here occurs is twofold. In this dry, hardened condition it more readily yields to the rasp-like action of the laminæ ; and, secondly, this finely divided, pulverized state greatly favours the action of the digestive juices.

The fluids which flow from the omasum are either quickly absorbed in the abomasum or pass rapidly onwards to the intestines, so that the digestive juice becomes but slightly diluted.

The assertion that this dryness serves to prevent a backward flow of the abomasum contents during rumination cannot be regarded as true. The lower canal of the omasum is still open, and, were no other hindrances placed in the way, dryness of itself would not suffice to prevent the passage of food along this canal. The sphincter and velum, and at the reticulum end the contracted œsophageal groove, are the hindrances, the obstacles to be over-

come (Lemoigne). The most trifling contraction of the third stomach is sufficient to prevent the re-entrance of food into its chambers. Further, it is scarcely probable that nature would have adopted such a complicated method in a case where the simplest valvular arrangement was all that was required.

Before quitting this subject, I should like to offer a few suggestions which may serve to solve the question so often asked, How does it come about that in those diseases with which a paretic and paralytic condition of the first stomach is combined, increased dryness of the contents of the third stomach should take place?

The reasons are not far to seek. The conditions are exactly the same as when we place a mass of moistened oatmeal in a vessel whose bottom is porous and permeable. The mass becomes gradually drier and drier, from the draining away of its water. If the food remains a long time in the psalter, the absorption will also play a part in aiding this exsiccation.

One of the main factors, however, in producing this excessive dryness is the cessation in the supply of new moist alimentary matter to that already contained in the chambers.

In rumination every time that a bolus of food passes beneath the velum pendulum palati a certain quantity of fluid (which has been expressed by pressure from the bolus) is re-swallowed (Fürstenberg). The majority of this will pass along the œsophageal and psalter grooves direct to the abomasum, a small portion being, however, taken up by the dry masses in the psalter chambers. When, therefore, in disease rumination ceases this constant addition of moisture no longer occurs.

The most essential fact, however, to be borne in mind is that no more food is swallowed. The freshly arrived masses are rich in liquid, and they it is which prevent under normal circumstances an excessive dryness. Whether it be accepted that they pass from the mouth direct to the omasum, or that every time a bolus is forwarded from the rumen to the mouth a similar portion is lifted from the reticulum into the œsophageal groove to be passed into the omasum, or that the latter occurs only in the intervals of rumination and feeding, the effect in disease will be the same. The rumen and reticulum being in a paralytic condition, this swallowing must cease. But before the reticulum becomes entirely inactive its contractions are less energetic, so that the food and fluids are only elevated as high as the bridge along which they travel direct to the abomasum. Thus, even prior to complete inactivity setting in, the entrance of moist masses into the psalter chambers has ceased.

The above facts fully serve, we think, to explain the extraordinary degree of dryness of the psalter contents in diseases combined with paralysis of the first two stomachs.

EXCERPTS FROM FOREIGN JOURNALS.

BY H. W. STEEL, ARMY VETERINARY DEPARTMENT.

Pleuro-pneumonia Contagiosa.

Two articles in *Achives Vétérinaires*, one in *Annales de Méd. Vét.* and *Bulletin de l'Aca. Royale de Belgique*, 1881. M. Delmotte discusses the manner in which Pleuro-pneumonic virus inserted under the skin acts. His observations are based on a question by M. Rossignol, "Are animals reputed healthy, but inoculated as a preservative against prevalent Pleuro-pneumonia, by the operation rendered capable of communicating the disease to other cattle, among which they are allowed to move and work? Otherwise ought they to be sequestrated as suspected animals are by law required to be? or

would a shorter quarantine suffice? and, if so, what should be *its* duration?" In the case of Variola and Sheep-pox, vaccine or Sheep-pox virus gives rise to a benign attack of the same (?) disease, which, by purifying or despoiling the system in a special manner, preserves it from a more severe attack of Variola or Sheep-pox. This explanation is well based and rational, but in Pleuro-pneumonia we are entirely ignorant of the mode of action of the virus, except that when this is introduced beneath the skin it does not produce chest lesions, and so if there is Pleuro-pneumonic infection we have no proof of it in lungs or pleura. There were three original theories advanced in 1855.

I. Dr. BÖENS, of Charleroi, considers inoculation causes a more or less prolonged artificially produced disease, which, by the eliminations it causes, and by the systemic changes it produces, renovates the substance of the body and purifies the economy. So Verheyen has formulated a pathological principle: "Every general or generalized disease which has lasted for a certain time and been followed by a return to health, *usually* fortifies its victims against most of our epidemic and epizootic disorders." Boëns believes in vaccinal inoculation, but not in the specific virtues of vaccine. He believes the systemic perturbations caused by vaccine secure, to an extent, immunity from eruptive and continuous fevers other than, as well as Small-pox. This view, if true, would explain the hitherto incomprehensible facts that knackers enjoy an immunity from Glanders, Farcy, and Charbon, also night-men from Typhoid Fever, Cholera, etc. This view is to be looked upon with reserve; thus, if it be true, in 1871 animals inoculated for Pleuro-pneumonia ought to have escaped Cattle-plague. Again, other similar facts bear against it.

II. M. THIERNESSE considers that the temporary preservation which is attributed to inoculation must be due to a derivative or revulsive action, rather than a true action of a force. Thus MM. Bouley and Mollereau find that inoculation gives rise only to a local affection at the seat of inoculation, and as it does not cause Pleuro-pneumonia, the animal inoculated cannot convey that disease.

III. M. CAGNY, of Senlis, considers that Pleuro-pneumonia in all its virulence is produced by inoculation; but then the local phenomena of the disease are brought about in an organ of minor physiological importance, and therefore this disease is less dangerous to the animal. In all cases of effective inoculation he observes a general disease with febrile symptoms in addition to the local disorder, which latter is denoted by lesions exactly resembling those found in the lungs in the ordinary disease (which is truly produced by *pulmonary inoculation*). M. Cagny's view is only, we believe, the expression of a pure induction from data more or less theoretical, the value of which as basis for argument is therefore most doubtful. It must be remembered that we have no evidence that Pleuro-pneumonia affects the blood: introduced by inoculation into the system of animals, that fluid has not proved protective. M. Cagny must also remember that many simple local lesions are frequently associated with constitutional disturbance. Also the local lesions, whether in lungs or tail, are only the ordinary results of inflammation: they, in themselves, give no evidence of specificity. What, then, is a generalized malady? We deem it one in which all parts of the organism are, or can be, the seat of the specific lesions of the disease, in which a virus or deleterious agent affects the whole system or causes blood disorder by its toxic influence.

M. WILLEMS, who has made this disease a special study for thirty years, considers it undoubtedly *general* and *specific*. He finds its plastic exudations everywhere—in the liver and muscles, for example. He and M. Van Kempin, in 1851, first pointed out the presence of a corpuscle with a special movement in the fluid product of Pleuro-pneumonia. The disease therefore is parasitic, not virulent. M. Willems also states that the liquid from the swelling which results from inoculation is preservative, and loses none of its virtues at the

twenty-fifth generation. He attempted to generate the disease in lungs and pleura by means of a "spray" apparatus, but with negative results. The fluid from the inoculated part destroys rabbits or guinea-pigs in about thirty-six hours, and the blood from this gives similar results when inoculated into a second similar animal. At St. Gall (Switzerland), in July, 1880 a butcher scratched himself in cutting up the carcase of a Pleuro-pneumonic beast. The arm became inflamed, but was neglected at first, and the unfortunate fellow died after two days of cruel suffering (see *Gazette de Lausanne*, 29 July, 1880). Probably all these are septicæmic rather than Pleuro-pneumonic results. It is also considered that immunity may be conferred by inoculation without any apparent diseased changes of the inoculated part; thus, if immunity is not secured by local lesions, it must result from an imperfectly known specific action of the virulent fluid on the organism.

Four theories have been brought forward to explain how the virus acts as a preservative.

I. *Theory of Spoliation* (Pasteur and Chénier). Attributes immunity to the despoiling action of microbia introduced into the circulating blood. In the production of one crop of microbia the soil is so exhausted as to ensure freedom for some time (longer or shorter). It therefore matters little, according to M. Chénier, whether the lungs or skin be the way of entry, in so far as the immunity is concerned: the main difference is in the relative importance of the local lesions. This is a plausible view, but are the organisms present sufficient for so great results? If their power prove great enough to overcome their want of numbers, they must act *for some time.* Can we allow that a few enfeebled microbia, being for a short time in an organism, will suffice to so thoroughly despoil it of all nourishment?

II. *Theory of Toxic Excretion.*—Supposes that the Bacteria of the inoculated fluid excrete a toxic principle which opposes the development and multiplication of like Bacteria. Here, again, it cannot be admitted that a small number of microbia can have so great influence as thousands of the same beings, unless length of time atones for paucity of numbers.

III. Willems and Cagny suppose that the engorgements at seat of inoculation are *Pleuro-pneumonic*, and the morbid processes confine themselves to these parts and yet exonerate the lungs; but the swelling is not essential, and may be only septic.

IV. (Böens and Verheyen.) The inoculated fluid when absorbed produces so marked systematic disturbance as to ensure immunity against fresh infection.

The problem we are discussing is unsolved. *We do not know how the "vaccines" (any fluids used for preservative inoculations) act;* but this will not prevent our benefiting by their indubitable utility.

MM. Bemylants and Verriest, of the University of Louvain, in March last, found the Pleuro-pneumonic bacterium or microbim in the lung tissue and expressed fluid, and also in the fluid obtained from an inoculated part. They also cultivated this organism, in order to more certainly establish its nature and relations to Pleuro-pneumonia, and also to produce it in large quantities and free from impurities. The "culture fluids" used were beef tea made from muscles or lungs, also a solution of Liebig's extract. After exposure of the flasks to 19°, on the third day the contained fluid became turbid and flocculent, and was, on microscopical examination, found to contain an enormous number of cocci isolated, in pairs or fours, or in threes arranged in a triangle; some even in series of four or five and ten, so as to form long chains; others in groups of various sizes, of which, however, the components were more or less regularly arranged. Size of cocci variable, the largest being about one micromillimetre in diameter, and moving slowly, their figure slightly oval; the smallest being spherical and rarely isolated,

also with slow movement. The isolated cocci moved much more freely. There were also red corpuscles, shrunken and deformed, and some accumulations of white corpuscles, swollen and riddled by cocci. The cultures were successfully made hundreds of times, and cocci which had been kept in closed tubes for a month gave excellent cultures. The limit of resistance of the coccus to temperature was found to be 59°—60°. Many successful inoculations have been made with these culture fluids, pustules resulting at the seat of inoculation, and the fluid contained in them bearing micrococci in abundance. In no case did the septic gangrenes which follow ordinary inoculation with pulmonary exudation result; this is therefore an accident, resulting from impurity of the fluid ordinarily used. At present experiments are being made with a view to the introduction of the disease through the respiratory organs, the animals used being kept in a cloud charged with micrococci produced by a spray-diffuser. In discussing the recurrence of Pleuro-pneumonia after recovery from the disease, naturally or artificially generated, M. Willems quotes the results of the 867 inoculations on many farms as published by Sigs. Capitani and Franceschi, of Milan: "(1) Inoculation is the only preservative against Pleuro-pneumonia; (2) it preserved from contagion ninety-seven per cent. of the animals inoculated; (3) five per cent. had extensive inflammation of the tail; (4) inoculation produces no effect on animals once successfully subjected to this operation." To learn whether inoculation affects the whole organism or is purely local in its action, inoculations were subsequently made in other parts of the body than that originally operated upon, but without effect. It was judged that a second or even third inoculation is useful to ensure safety, as MM. Chauveau and Pasteur have proved, in Anthrax and Fowl Cholera. The more successful the inoculation as a preventive, the greater the swelling of the inoculated part. M. Lenglen, of Arras, says, "At the present time (1863) I am making use of virus of the twenty-fifth remove, which has lost none of its preservative value." A Belgian scientific commission, nominated by the Minister of the Interior, will shortly investigate inoculation for Pleuro-pneumonia at the State Veterinary College.

Anthrax.

On 14th March last the Academy of Sciences, Paris, awarded the Bréant prize, value 5,000 francs, to Professor Colin, of Alfort, for his researches on Septicæmia and Anthrax. This award is well timed, for the journals contain his paper read before the Academy of Medicine on 4th November, 1879. He had previously found that virulence in a not very long time after burial, disappears from a carcase. Pasteur affirms that the soil around takes up the bacteria and acts as a culture medium for them. He buried Anthrax victims, and subjected the superincumbent soil to influences of the most varied kind which could be suggested to influence bacterial development. He fed thirty-five animals on plants, dry or moist, grown over the carcases, without ill effect. "These first results," says he, "are already anything but favourable to the hypothesis of a culture and preservation of the elements of virulence in soil containing Charbonous *debris*. If these elements were in the soil which covered over sixty carcases, how was it they produced no effect on at least some of the thirty-five (also the sixty-one subjects of experiment who were parked for half a day or for an entire day on the soil) fed four times on the fresh herbage, mixed with mould and dust, brought directly from above the carcases, and also consumed food sprinkled by design with powdered and dried earth, etc.?"

Glanders.

M. Galtier has been inoculating dogs with Glander material, and has always communicated the disease to them. The morbid lesions in almost

all cases remain localized at the seat of inoculation, but an apparently non-diseased lymphatic gland from one of the subjects caused the disease in an ass. The dogs invariably recovered completely, but could be inoculated successively a number of times, and virus passed through the system of the dog caused death of asses only after attacks lasting from three weeks to a month. The author indicates this as a sign of loss of power of the virus, and suggests further experimentation in this direction. He also judiciously advises that the inoculation test for Chronic Glanders be made on the dog rather than on the ass. The local lesions in the former are exactly those of a Farcy ulcer in the horse.

Rabies.

The following instructions have been published in the Department of the Seine :—"Every person bitten by a mad dog should take the following precautions :—(1) *Immediately*, by energetically squeezing the parts around the bites, slight as well as deep, cause them to *bleed* freely, and *wash* them as completely as possible with lots of water, with a jet of water if possible, or with any other available liquid (urine even) until cauterization. (2) This can be done with Vienna caustic (nitrate of silver?), butter of antimony, chloride of zinc, or preferably a red-hot iron. Any piece of iron (the top of a rail, a pressing or plaiting iron, or key) raised to a red heat will serve the purpose, *and should be made to touch every part of the wounds.* (3) The success of these cauterizations depends on the promptitude with which they are made: *any one can carry this out before the arrival of the doctor.* (4) Cauterization with ammonia and alcohol are entirely useless."

THE STRONGYLUS BRONCHIALIS.*

BY MR. GREY, JUNIOR, M.R.C.V.S.

AT the present day there cannot possibly be an individual whose occupation leads him amongst cattle and sheep, who is not aware that there is an affection to which these animals are prone in certain seasons, such affection being vulgarly termed Hoose, Husk, Wisk, etc.

This disease is caused by the presence of a parasite in the bronchi and air vesicles, and which causes so much irritation to the mucous lining of these structures that the animal is generally seen to be constantly coughing; that cough being a very peculiar one, and not easily forgotten if once heard, but difficult to describe, hence the affection has received so many uninstructive names.

On making a *post-mortem* examination of an animal that has died, or has been killed and found affected, there is never any difficulty in finding these parasites in the bronchial tubes, as they attain very respectable dimensions considering the locality they are found in, some of the largest being about two-and-a-half to even three inches in length, and closely resembling a coarse cotton thread after having been steeped in water for a short time; hence the class to which they belong is termed *Hemaboiæ* (round or thread worm), and as they are of rather a whitish-yellow colour, they are easily detected lying on the surface of the more or less inflamed mucous membranes. In some cases thousands of these worms may be found in a bronchus rolled up into a mass of entanglement, whilst in others one has to track up the smaller bronchi with the point of the scalpel before they are detected. In all cases there is very little time or trouble required before one can safely come to the conclusion whether an animal has suffered or not from this lung worm. Their presence (if seen) is the proof positive of the disease.

* Read at the meeting of the Scottish Metropolitan Veterinary Medical Association, on May 18th.

But I would ask, as others have done before me, How came these worms here? and how did they gain access to the lung structure? Able writers have discussed these questions, and various theories and suggestions have been put forth, but as yet no positive proof has been brought to bear to verify these theories and suggestions—in fact, the question is as yet undecided. Some authors are under the impression that these worms gain access to the lungs in a comparatively direct manner by passing down the trachea; whilst Mr. Armitage, in his essay on "Hoose," published in the Highland and Agricultural Society's "Transactions" for 1878, asserts that the ova are carried to the lungs from the intestinal tract by means of the circulation, and (to quote his own words) "*are eventually arrested by the tissue of organs most favourable to their wants and development, which, in the present instance, is the lungs of lambs and calves.*"

Why the lungs of calves and sheep should be endowed with the functional power of arresting such substances traversing the circulation as the ova of the strongylus, is to me inexplicable. Had the ovum of a strongylus the power whereby it could arrest its own progress whilst being carried through the circulation, then it would be very feasible that it would do so when it arrived at the suitable pabulum for its own growth and development; but it so happens that these ova, which may be compared to a miniature fowl's egg, have no more power to arrest their progress whilst being swept along with the circulation than has a fowl's egg when thrown into a mill race. Moreover, I have spent days of fruitless search examining microscopically the blood of suitable animals for the presence of ova, yet on careful examination of *extremely thin* sections of lung-tissue I have been able to detect the parasite in all its different stages of development: here the unbroken granulated ovum; there the newly-escaped embryo; in another portion of the field could be seen the still further developed parasite; and lastly, portions of the adult worms, which, being too large to escape the section knife in the cutting of a specimen not $\frac{1}{1000}$ part of an inch thick, consequently became severed. (These specimens I now retain in my possession.)

Dr. Cobbold's experiments go a long way to show that this parasite—like a great many more, *probably*—has for its proper development an intermediate bearer. I cannot, however, reconcile the statement made by Mr. Armitage, that its progenitors are the worms found in the intestines. If such were the case, and their ova were carried by the blood, surely investigation (microscopically) of an animal's blood would give some satisfactory result by the detection of these ova in the blood. Moreover, he tells us that the worm whilst residing in the lungs is not capable of propagating its own species, and denies the fact that they are endowed with generative organs whilst in this locality. This statement is certainly erroneous. I have never had much trouble in making out both male and female, and as regards the latter I have never as yet examined one taken from the lungs of either sheep or calf that was not literally crammed with ova and embryo, an example of which is under one of the microscopes at present on the table.

Mr. Armitage seems to believe that the ova find a natural passage between the epithelial cells investing the villi of the intestines; the fact is, however, that one of these ova is as large as five epithelial cells taken together, and every one must know that no such apertures sufficiently large to admit anything the size of an ovum exist between the epithelial cells. The experiment with finely divided charcoal proves nothing, as there is no comparison between the size of the charcoal particle and that of a strongylus ovum.

The following is a brief description of my experiments with this parasite:—

On either the second or third Thursday in the month of April, 1880, a sheep was slaughtered in the Edinburgh abattoir, and was found to be affected with some lung disease. A portion of the lung (about four inches square)

was given me to make a microscopic examination of, but, being rather busy, I forgot to take the specimen home with me. Not being at college till the following Monday, all thoughts of this piece of lung escaped my memory until my attention was again called to it by Professor Walley. It had been lying all this time wrapped in a piece of brown paper—the weather, I may remark, being extremely cold as snow was lying on the ground.

On the Monday evening I took the specimen home and subjected it to the following treatment :—Upon unwrapping the parcel the first conclusion I came to was that it had been a case of disseminated Catarrhal Pneumonia (as I had no information given me as to what the lesion was), but on squeezing the lung structure I failed to get the catarrhal pellet oozing from the bronchi ; still I was under the impression that it was a case of Catarrhal Pneumonia, and consequently subjected the specimen to the *general treatment as regards preparation for microscopic investigation.* How it was that I got the following results I never yet can account for.

In the first place, I selected a portion of the lung, about three-quarters of an inch square, and placed it in the well of the microtome embedded in gum mucilage. I then packed a freezing mixture of snow and salt into the body of the instrument for the purpose of freezing the gum, and also freezing the portion of lung, whereby it could be cut by the section knife into extremely thin sections. The process of freezing occupied nearly three-quarters of an hour, as the room I was working in contained a fire. When thoroughly frozen I cut from this portion of lung between 700 and 800 sections. When each section was made it was transferred from the blade of the section cutter into clean, chilled water for the purpose of thawing out the frozen gum and gettin rid of entangled air-bubbles. In this water the sections were thoroughly washed, and then transferred into the following staining solution:—Carmine grs. xx., Strong Liq. Ammonia ʒiss., Distilled Water ʒiv., Camphor sufficient to saturate the above ; in which they were allowed to remain for *five minutes.* From this solution they were taken and placed in water strongly acidulated with glacial acetic acid, for the purpose of washing off superfluous staining ; from thence they were placed on a glass slide, and mounted in a fluid, which consisted of a saturated solution of arsenious acid in boiling water, together with glycerine and gum arabic.

On applying the cover glass and examining the specimen with the low power (fifty diams.) hurriedly, I noticed that the air vesicles were infiltrated to a great extent with some material which required a much higher power to make out, and on applying the high power (300 diams.) what appeared under the low power as an infiltration, *was a living mass of strongylus embryo,* endowed with the most lively movements, each working its own way from one air vesicle to another—now in focus, now out ; then appearing as if crossing the superficial layer of the specimen ; then diving eel-like amongst the deeper layers, thereby necessitating one hand constantly on the fine adjustment to be able to follow their movements, which were easily discerned, as the carmine solution had stained the lung structure deeply, whereas the embyros were not affected, and remained of a yellowish-white colour.

They were alive, and their movements very active two hours after the cover glass was dropped on the slide. Every specimen examined gave the same results, and the first thing that struck me was, how many of these embryos had I lost from each section during the washing and staining processes? An examination of the fluids showed countless numbers.

The next thing which surprised me was, how had so many embryos escaped being severed by the section knife, when I calculated that each section could not be the $\frac{1}{1000}$ of an inch thick?

Above all I was surprised, after having subjected the specimens to a temperature a few degrees below zero (Fahr.) for about an hour, followed by

immersion into chilled water, then into an ammoniacal solution which was painful to my own eyes and nose, from this into strongly acidulated water, next into a poisonous solution of arsenious acid, and, finally, having hermetically sealed them under a cover glass, to find the embryos alive, their movements being frantic in the extreme. I watched them for hours till sleep overpowered me, thus preventing me from seeing their last movements.

I kept no strict memorandum of time, except the five minutes' immersion in the staining fluid; but the whole process, from beginning to end, as I have described, occupied about eighteen consecutive hours.

More than twelve months have elapsed since I cut the above-mentioned sections, and since that time I have had ample opportunity of getting the same results; I have done so over and over again, to try and prove that in the first instance I must have been mistaken. I have as yet failed to do so, and, whilst conducting the practical pathology class in Dick's Royal Veterinary College, I had the satisfaction of being able to give every member a specimen of the above description. So much for the embryos in the meantime, and now let us see where they come from. To solve this question we must necessarily examine its parent "the adult worm." On procuring a mass of strongyles from a bronchus one has no difficulty in finding a female; the males, however, are not so plentiful as the females.

On examining the female under the microscope, thousands of ova may be seen in its interior; some of the ova will show a granulated appearance only; in others, again, may be seen the more developed embryos coiled up in figure fashion, but not endowed with movements; in other ova, again, may be seen the embryo writhing about in its eggshell, so to speak; whilst in another portion of the specimen (worm) may be seen the embryo which have now escaped from their capsule, but are as yet retained within their parent. One of the specimens at present on the table demonstrates this beautifully, with the exception that the embryos are not alive.

These young embryos seen in the female adult may also be seen in any section made through the lung of an infected animal. Their habitat appears to be in the air vesicles, whereas the more fully developed worm is found in the infundibula and smaller bronchi.

A peculiar fact is this, that when an animal such as the lamb is killed by the effects of these parasites, we always find the lungs assuming the appearance of the second stage of Catarrhal Pneumonia, which is caused by the thousands of these embryo being located in the air vesicles, there setting up irritation, and thus causing proliferation, and desquamation of the lining epithelium. Some portions of the lung may show a number of caseous nodules scattered throughout its substance, and this has been likened to tubercle. This caseation is easily accounted for when we remember that all epithelial products are very liable to undergo caseous metamorphosis.

I agree with Mr. Armitage in this, that when these nodules are examined with a 300-diam. objective they are seen to be composed of metamorphosed lung tissue, the centre or nucleus of each nodule being a strongylus ovum, but I must again differ from Mr. Armitage as I cannot look upon these nodules as being one of the different stages of development, through which this parasite has to pass in order that it may arrive at maturity.

I consider these nodules are composed of caseous material, such caseous material being formed around the ovum by the pathological processes of proliferation, desquamation, and, finally, dry fatty degeneration of the desquamated epithelial cells which lined the air vesicles in which the ovum, or ova, were located; moreover, I consider the above process the best thing that could have occurred as regards the life of the infected animal, because, once an ovum is in this manner encapsuled there is not much danger of it

ever becoming a fully developed strongylus, as it has now become imprisoned and cut off from all source of nutriment. We see this process taking place in many other diseases, notably old-standing Pleuro-pneumonia Contagiosa.

I would ask, (1) If an intermediate bearer is necessary, how is it we always find countless numbers of these parasites in a mature form in the lungs of an animal that is comparatively young, such as the lamb?

(2) Taking into consideration the numbers that are found in the lungs, and assuming that they gain access there by means of the circulation, how is it that microscopic examination of the blood gives negative results as regards the presence of ova?

On microscopic examination we find the living embryo in the air vesicles, we also see it in the adult worm, and we also see it in the ovum, such ovum still being retained within the adult worm—in fact, in every half cubic inch of an animal's lung which has been the subject of Hoose (such half cubic inch showing to the naked eye the characteristic lesion) there is, as far as my observations have carried me, ample opportunity for demonstrating twenty times over all the different stages of the growth and development of this parasite.

The following conclusions may be readily drawn from the foregoing :—

First, these parasites multiply with extraordinary rapidity.

Second, their tenacity of life, especially of the embryo, must be extreme.

Third, infection by one impregnated female is quite sufficient in the course of a short period of time to kill the animal which becomes its host.

Fourth, the inhalation of the ova, provided they gain access to a suitable pabulum, and that the ova themselves are capable of germinating, is sufficient to produce the disease.

I am forced by my own observations to conclude that there is no necessity for an intermediate bearer for the full development of the *Strongylus filaria* or micrurus. I am under the impression that they gain access to the lungs either during the process of rumination, or by inhalation ; my reason for adding inhalation being, that in the human subject (and also in the horse), in cases of Anthracosis and Silicosis, comparatively large pieces of coal and stone are inhaled, and when such a heavy, irritating substance as flint stone dust, every particle of which has its peculiar-shaped angle, can be taken into the lungs by inhalation, I fail to see why such a light and smooth substance as the ovum of one of these strongyles cannot be inhaled also.

I am also of the opinion that if the practitioner looked upon each and every strongylus he sees as being capable of producing death to an animal in a comparatively short period after having gained access to its lungs, it would cause him to be more careful as regards giving instructions for the complete destruction by fire or some other such agent of all lungs found affected.

If this method of prevention were fully and conscientiously carried out, I have no hesitation in saying that in the course of a few years the average mortality of our domestic animals which suffer from this disease would be greatly lessened.

Principal Walley, referring to some pathological aspects of the disease, could not endorse Dr. Cobbold's theory of the earth-worm being an intermediate bearer, nor was it easy to admit the assumptions of those who regarded these worms as intestinal, their habitat being purely and simply the lung. He regarded contaminated grass or vegetable matter as a chief means of spreading the disease. That their development in the lung was most likely was generally admitted, though it must be confessed that at present very little was known regarding the mode of development.

Mr. Cunningham thought these diseases should be as closely looked after as those which came under the Contagious Diseases (Animals) Act—(hear,

hear). The lungs of diseased animals should be carefully done away with, and means should be taken to prevent these ailments from spreading, as now, from one pasture to another.

On the motion of Mr. Rutherford, a vote of thanks was accorded to Mr. Grey for his valuable paper.

THE "PENAL CLAUSE," AND THE "APPRENTICESHIP OR PUPILAGE CLAUSE."

BY THOMAS GREAVES, MANCHESTER.

IN bringing these subjects before your notice my chief aim will be to make the various points as plain and as convincing as possible. I am aware that different members of my profession put different estimates of value on each of these subjects, and in discussing them I will endeavour to deal fairly and impartially with them. First, then, we will consider the

Penal Clause.

This is known in relation to our profession as a clause in an Act of Parliament, whereby we shall have the power to indict before a magistrate any person who assumes the name or title of veterinary surgeon who has not got the diploma of the Royal College of Veterinary Surgeons; such Act giving the power to any magistrate to inflict a penalty of £20, or any other sum which the Act specifies, against any person so offending. At the present time we have no Act of Parliament to inflict a fine or penalty against any person transgressing; it is true we have a Royal Charter of Incorporation, which specifies "that we of all other persons shall be known and distinguished by the name or title of veterinary surgeons;" but there are no penalties attached in this Royal Charter of Incorporation, nor would it avail if penalties were attached, as they could not be inflicted. It was not an oversight on the part of the framers of the charter. There is a vast difference between a Royal Charter of Incorporation and an Act of Parliament; a charter is granted by Her Majesty, giving to the individual, or to a body of men, certain rights and privileges, but the Queen has no power whatever to give a power to a magistrate to inflict a fine or penalty; the Crown lawyers have decided that no charter could confer on us the exclusive title. You will now see how it is that we seek for an Act of Parliament to prevent persons calling themselves veterinary surgeons who are not, by doing which we believe a great wrong is perpetrated against us, at the same time the public are deceived, defrauded, and injured. It would be well if we could extinguish the pretender and the empiric; we do not go so far as to say we shall prevent such men practising. I do not for one moment assume that we can ever accomplish this. I do not believe an Act of Parliament could possibly be obtained with such powers in it, and even if it could, it could never be carried out. As matters stand at present, any man, however ignorant he may be—and in using the word ignorant I do not merely mean ignorant in his general education, but ignorant also in the matter of the treatment of sick and lame horses—can call himself a veterinary surgeon, and who, by calling himself a veterinary surgeon, the public are led to employ him. These dishonest and dishonourable courses we seek to put a stop to. Let him call himself by whatever name he chooses, he must be unmasked, and the public must know that he is an unqualified man. Let us do everything we can to lessen this loathsome fungus quackery. Then the question arises, *How much will the profession be benefited when this is done?* The public will still employ him more or less—aye, and in some cases he will be preferred to the inexperienced though duly qualified men. What then? Will it not be even more humiliating to the duly qualified man than it is

now? The qualified man will not have the excuse he has now, viz., that the public employ him not knowing that he is a non-qualified man. The tug of war will then be, as I have always contended it must be, viz., "*the best man wins;*" and this brings me to the grand and burning question of the day, viz., Veterinary Education. The qualified man with ever so high an education and gentlemanly manners, with all his scientific attainment, if deficient in practical knowledge—if he goes about his horse like a tailor, cannot give a ball or put a hobble on, cannot pare out a lame foot, or even tell with any degree of certainty which foot is the lame foot, I say it with considerable humiliation, but it must follow that the practical though non-qualified man (assuming he is a man of ordinary ability and education, who goes about his work in a workmanlike and horsemanlike manner, although he has "Farrier" on his sign) will beat the qualified man out of the field. We may be giants in science and in theory, yet be babies in practical knowledge. There are hundreds of instances of this kind, in which the educated and qualified man, feeling that he is a failure, quits the profession in disgust, and enters into some other calling more genial to his tastes and the bent of his nature. Had such a one been apprenticed, his inaptitude and utter unfitness for our profession would then have been made apparent, and much of this lost life and expense saved; and these instances will be continued and be repeated so long as our profession exists, unless we make the practical teaching of our rising veterinary surgeons obligatory—to use Mr. Fleming's own words, "Whatever the profession wills to have, in reason, that it will obtain."

In compliance with a petition emanating from the Lancashire Veterinary Medical Association, praying the Council to apply to Parliament for a Bill to protect the name and title of veterinary surgeon, and offering to pay its share of the expenses, and which was duly presented to the Council; also one on the same subject from the Yorkshire Veterinary Medical Society, and one from the Liverpool Veterinary Medical Association; another from the Belfast and North of Ireland Veterinary Medical Association; another from the Midland Counties Veterinary Medical Association; another from the Norwich and Eastern Counties Veterinary Medical Association—all to the same purport, our President felt that a call from such important bodies, being a fair representation of the whole profession, demanded attention, and he got a Bill, intituled "The Veterinary Medical Act," drafted out, and submitted it to the Council. After a careful and deliberate discussion on the various clauses, the Council decided that it should be forwarded in its present form to Lord Aberdare for introduction to the House of Lords as a Government measure. In the Bill, in clause 2, it sets forth—"Any person who shall wilfully and falsely pretend to be, or take or use the title of veterinary surgeon, or any name, title, or addition or description implying that he is a professor or practitioner of the said veterinary art, or that he is registered as a member of the Royal College of Veterinary Surgeons in the manner hereinafter mentioned, or that he has received a diploma, certificate, or authority from the said college, authorising or entitling him to act as a veterinary surgeon, shall be deemed to be guilty of an offence, against this Act, and shall, upon a summary conviction for any such offence, be liable to a penalty not exceeding ———, or to be imprisoned for a period not exceeding———."

The Bill has passed through the House of Lords, and it has been altered in some particulars very greatly; for instance, it has been decided that all those practitioners who have been practising for five years, or longer, shall be entitled to claim to be registered by the Council of the Royal College of Veterinary Surgeons; but although registered in the same register that we are registered in, they will occupy a separate part of the register, and under the heading of *Existing Practitioners*, and have nothing whatever to do

with us or with the college. They must prove to the Council that they are worthy of registration; if the Council refuse them they have the power to appeal to the Privy Council, to which body the Royal College have to send in writing the reasons why they have refused to grant registration. If it is found that the Royal College have refused on insufficient grounds, the Privy Council can order the Royal College to register such individual; but it is considered that such a case will very rarely or never happen. If these practitioners omit to register themselves within one year after the passing of this Act they will be liable to a conviction, and incur a penalty of £20 if they continue to practise. This Act gives us the exclusive right to the title of veterinary surgeon, therefore, from and after 1883 quackery is dead in our profession if this Bill passes. Mr. Fleming says, "This Bill is a splendid one, far better than I ever anticipated; our future is brilliant, is splendid." We hope and pray that it may come out of the Commons none the worse for the ordeal it has to pass through. George Fleming, our President, has worked like a lion for us, and is worthy of all the thanks and honour that our noble profession can accord to him.

I will divide the practitioners of veterinary medicine into three classes:—

1st. Practitioners who possess some practical knowledge, but who have little or no education.

2nd. Practitioners who possess the requisite practical knowledge, and also a good sound English education.

3rd. Practitioners who possess a high classical education, but little or no practical knowledge.

First Class.

Who are these? They are the men who constituted our profession before we had a veterinary college; they were the village blacksmith, the groom, the horse-breaker, and such-like men, almost destitute of education, and occupying the lowest status in society. This is the foundation of the character of our profession; "even at the present day there are vast numbers of men of this class who profess and practise the treatment of our domesticated animals." It has to be admitted that until very lately men of this class have entered our colleges, and some of them have managed to gain a diploma. These men could only associate with men of like education and status in society; the effect of this, so far as it went, was to stamp on our profession the character of a low calling. This was put a stop to, in some measure, during the year I had the honour to occupy the high position of President of the Royal College of Veterinary Surgeons, when the preliminary examination was introduced. The mistakes consequent on the ignorance of the above class were a disgrace to any calling; but in all this there was occasionally observed a silver lining. There were always amongst them a few men of tolerably fair education, and possessing ability and good sense, together with practical experience, and who conducted their business with credit to themselves and with satisfaction to their employers.

Second Class.

Who are these? They are the practitioners who possess a good sound English education; have been thoroughly taught the business of their profession; obtained their diplomas; gone forth to practise their calling with credit to themselves and satisfaction to their employers. I have said they are men who have been thoroughly taught the business of their profession; by this I mean *that they have served an apprenticeship to a veterinary surgeon*—been regularly initiated into the work of the business; then gone to college, and got their diploma. Our forefathers were convinced of the necessity of this course of instruction. Much was said, and well said, by

some of our best and ablest practical men at the time our charter was granted, in 1844, about the advantages of every veterinary aspirant serving an apprenticeship to a veterinary surgeon. There was a rule or bye-law made in the Council at that time, that no student was eligible to present himself for examination by the Court of Examiners unless he had an indenture of apprenticeship showing that he had served three years with a veterinary surgeon. The bye-law ran thus: "No person shall be admitted as a member of the Royal College of Veterinary Surgeons after the 1st of January, 1848, who has not served an apprenticeship of three years to some member of the college in regular practice during the whole of that period." This bye-law broke down in consequence of the students then at the college not being able to comply with its conditions. There was not one at Professor Dick's college, and only four or five students at Camden college. The consequence was the bye-law had to be suspended to meet the case of the students at the colleges and enable them to be examined at all, and it has never again been insisted upon.

At that particular period of our existence the charter had been drawn up by our legal advisers and the parliamentary agent, and all the bye-laws were drawn up and subjected to his supervision. *The legality of our power to enforce this rule was never questioned.* We think at the present moment there is no doubt about it, we have ample powers given us by our charter; but our President is getting the opinion of the Attorney-General of England on this point. It is now said that the power we possess in rejecting a student at his examination is sufficient; but let me remind you that our present system has been in existence for thirty-six years and it is proved defective. The examiners are bound to pass the student if he answers all the questions satisfactorily. Mr. Fearnley wishes the Council "to recognise the fact that examinations can never really test the extent and soundness of a student's fitness to practise the craft." Although the examiners occupy about twenty minutes in examining the student on the live horse, and twenty minutes in examining the student on the live cow, sheep, and dog, and they now for the first time make the student put hobbles on the horse and cast him, still much, very much, has to be assumed or taken for granted by the examiner.

Let us now, for a moment, consider this question of a more strict, more searching and thorough testing of the student at the time of his practical examination in lieu of apprenticeship. To fully realise the difficulty, I must tell you it will be necessary to have fifty or more cows calving on the two or three days of the practical examinations; fifty or more colts to castrate; fifty or more cases of Neurotomy; fifty or more cases of Colic; same number of cases of Spavins or Curbs to be fired, and so on *ad infinitum*, because each student must perform each and every operation with his own fingers, under the immediate supervision of the examiners, to enable the examiners to form an opinion as to his manipulative efficiency. Now I say this must be done if the apprenticeship system is to be still ignored. You will now be able to form some idea and to see some of the difficulties, absurdities, if not the impossibilities, which stand in the way; and hence it is that the examiners say, and I say, we must be resolute and insist upon it. Let us make it imperative that this additional guarantee of his competency, viz., seeing practice, shall be made obligatory. I maintain that it is the duty, the bounden duty, of every veterinary surgeon in large practice, to be agreeable to take apprentices, and take every care and trouble to instruct such apprentice in his business; unless the general practitioner does this let us not throw all the onus upon the professors.

One would think, in taking a rational view of this matter, that the professors and colleges would be the first and foremost in demanding this important adjunct to their teaching, since it is to their credit and their honour

to turn out students as perfect and as efficient as possible, instead of as they are now; it will advance the true interests of the profession. Mr. George Fleming speaks most definitely upon this point. In considering this question of examination, let us try to understand it properly in all its bearings; we must not forget this, that the simple act of examination neither adds to nor diminishes the quantity nor the quality of the knowledge the student possesses. Let the Examining Board be constituted as you like, either wholly or in part of men occupying the highest positions in science and the classics, or wholly composed of veterinary surgeons—they do not add one jot or tittle to the student's practical knowledge, his natural or acquired ability, or contribute anything whatever to the securing his success or his eminence in after life. I maintain, then, that his knowledge and high abilities has nothing whatever to do with the examination; but it has everything to do with his natural capacity, and the nature of the teaching he has been subjected to in his youth and at college. Let us not assess at a fictitious importance, or at too high an estimate, either the examination, the college teaching, his education, or his natural capacity separately, but let us consider the matter as a whole, and ascribe to each its due importance. I am fully convinced that eight out of ten members of the whole profession believe that the young man who has been instructed and engaged in performing the duties appertaining to sick and lame horses for three or four years before he goes to college, is throughout life the better for it; it is lasting knowledge—he becomes handy and expert in those duties, gains business habits, becomes familiar with the sights, the symptoms and habits of his patients; everything is plain and easy to him, he performs his duties without noise, bustle, bluster, or trouble; he is diligent in business, he simplifies everything he has to do. That this knowledge or habit, coupled with the instruction given him in anatomy, physiology, and, more or less, chemistry, by his master, prepares him for his college teaching; provided always that such a one has had a good sound English education, and possesses good natural talent, and an aptitude for his profession, it must follow he will be a success. Such an education as this gives him confidence in himself, and creates confidence in the mind of the employers; he feels at home in everything he has to do.

The late Mr. Haycock, one of our greatest veterinary writers, says, "Man is of no value except so far as he is of use;" further on he says, "to train a pupil so as to impart a purely scientific education, would be to educate him wrongly." Again, "Parents are anxious for their sons to possess a thorough knowledge of the science belonging to our profession, hence many of them may be highly educated, and when so highly educated are rarely of use; educate highly in the sciences allied to our profession, and tell to one but the pupil will consider it beneath him to work, and unless he can work with his hands and his head he will prove a disappointment to every one. What the community demands from the veterinary surgeon, and which it will have sooner or later, is knowledge and power on his part to cure disease with precision and certainty where such results are fairly within the bounds of possibility." Again, "Two years of his time should be devoted to the shoeing-forge and the stable: the forge, to learn how to pare out the feet of horses and to nail on the shoes with readiness and facility; the stable, where he may become conversant with the habits of horses, and to feed them with judgment, and by grooming how to handle them with familiarity and confidence; he should obtain a rough general knowledge of the anatomy and physiology of the horse and the cow; he should learn the names of the bones, their relations, the number and variety of joints which they should form with one another; he should

also be ambitious to possess a small microscope and a few chemicals, and by working diligently with them during his spare hours he will gradually acquire a fund of information invaluable to him in after life." Again, "An erroneous belief prevails to the effect that our veterinary colleges are to teach young men a full and complete knowledge of the veterinary art. This belief is wrong in every essential; our colleges are not to teach any such thing, their use and purpose is to teach those laws and scientific principles upon which our art, strictly speaking, is based." They should be expert practitioners before they enter the portals of such an edifice; a mere diploma is valueless, and if he who owns it lacks the knowledge and experience it sets forth, the owner is simply a pretender and an impostor." "A veterinary surgeon should be industrious, temperate, and careful of the means at his command; he should possess a large fund of common sense, and great firmness of purpose; he should be thoroughly truthful in all his business transactions; should have the unfettered use of his head and of his hands; he should be a good sound pathologist, anatomist, physiologist, and microscopist; he should thoroughly understand the art of shoeing horses, and the principles on which the art is based; he should be unceasing in the observation and registration of facts relating to disease; he should know the true relation which exists between the disease he may cure and the means available for cure, and, above all, he should be prompt and decisive in their application; he should rigidly cultivate his powers of observation, especially in what relates to causation; he should possess a retentive memory, and a wide faculty of analogy; he should be able to handle horses and cows fearlessly and effectually, and be dexterous and cool in the performance of all surgical operations necessary to be done upon them; he should be able to perform the most common duties to be done to the horse or cow with the same readiness and facility that an expert groom, a common stable-helper, or a cow-bouger can do them; he should be quiet and respectful in his manner, and discreet with his tongue; he should be able to live coarsely, to dress plainly, to endure great fatigue, and to sleep upon a hard bed." Surely such an education must commend itself to every unprejudiced mind. Such a one is infinitely more likely to reflect credit upon the profession and upon himself, and be a far more useful member of society than the one, however highly he may have been educated, if he has had no opportunity of seeing cases, *or has been indifferent in acquiring practical instruction beyond what he happens to see at college.* It is quite true some young men who are apprenticed and pay a premium are above the ordinary duties in a veterinary establishment; they labour under the fallacy that they can gain the knowledge without the trouble of acquiring it. I know some veterinary surgeons who object to take such apprentices on this ground; they prefer some sharp, intelligent, industrious youth in low circumstances, from the stable, or forge, or other occupation, notwithstanding his education may be deficient, one who willingly performs the duties and is anxious to learn; it is often found that these plodding, intelligent youths, if they afterwards go to college, and get their diploma, make the best men. Have we not Professor Coleman's and Professor Dick's sanction for this statement? They over and over again said that the son of a blacksmith or the son of a groom always made the best veterinary surgeon.

The apprenticeship system is peculiarly, if not essentially necessary in the veterinary profession. This has been advocated by me with earnestness and sincerity for over forty-six years. Every year of that period I have had most convincing instances come before me of the great importance of giving the youth who is intended for the veterinary profession a good sound English education up to seventeen or eighteen years of age. Then, during the next three or four years, get a good groundwork in the business of his profession

in a large practice with an intelligent master. If there is a large shoeing-forge connected to it so much the better, so he becomes acquainted with all kinds of foot cases. The knowledge he gains here only whets his appetite for more, makes him more anxious to receive deeper instruction; then send him to college for his five terms. Many foolish things have been said by eccentric individuals at times in my hearing, but one of the greatest absurdities ever propounded, which is in itself inconsistent with common sense, is this, to let a youth go straight from school to college; see no practice, only what he has taught him there, *and that only by precept*. Now I ask you to let us stop here a moment and deliberate upon the situation. It is right we should do. Who are these professors at the different colleges? They are veterinary practitioners like you and me; some of them have had some experience in practice, some of them have seen little or none. These gentlemen lecture on practice to the students. And what, let me ask, are lectures? It is a system of cramming and grinding, and we all know what the nature and object of cramming and grinding are: it is a means used to instil into the minds of students that special temporary knowledge which will be required of them at and to enable them to pass their examination. It will serve no earthly purpose only this; the knowledge is placed in the mind in an artificial manner, it is only intended to serve a special purpose; in most cases it is evanescent, vanishing, and soon disappears for ever. Contrast this with knowledge obtained by a youth working from morning to night amongst sick and lame horses for three years, his eyes, ears, fingers, and feet are taught it and understand it. The knowledge becomes part and parcel of himself; he cannot forget it in after life if he would; he has become handy in his work, and has acquired business habits which will stick to him through life. On this point let me remind you that it is one thing to put instruction into the mind of a man; it is another and greater thing to teach the man how to use that instruction. You must all see the vast difference between college teaching of practice and that taught (by working in it) in a practitioner's establishment. Mr. Fearnley says, and says truly, that college duties and general practice duties are as different as light and darkness. Manipulative skill requires practice, whilst perfection in it implies repeated failure, excusable in a 'prentice lad, but a deadly sin in one labelled "qualified." Some of our teachers recommend that the student shall go first to college, spend one or two sessions there, and then serve an apprenticeship to some practitioner of large practice. I can conceive no greater fallacy than this. Do we not all know a young man so situated is above being taught? *The idea has taken possession of him that he knows it all.* He cannot then stoop to learn the A B C of his business after he has been to college. Thus he skips over (*and never learns it*) one portion of his education, which actual practice teaches, and which is really of more intrinsic value to him in after life than some of that science which he is taught to soar after. Such a one gets his diploma and commences practice on his own account. You tell me he will soon gain experience; but how, let me ask, and at what cost? He will have to fill a ten-acre field with his victims before he has gained sufficient experience to be fit to be trusted with the treatment of sick or lame horses. And these are the men, forsooth! some professors say are the best men!

Our profession is a peculiar profession. There is no calling in life that requires more knowledge of human nature, more tact or policy. It differs in many respects from every other profession. We can ask our patient no question, can gain no clue to the nature of our patient's ailments only by our own close observation. This knowledge, I maintain, can only be gained by the learner spending much of his time in the company of his patient. It is absolutely necessary that he should see every kind of case; work indus-

triously amongst them ; do everything which appertains to a sick or lame horse with his own hands ; do his own thinking in every case. This entails a vast amount of hard work; it often necessitates long hours in the saddle or in the gig from early dawn till late at night. Thus, in conjunction with the mental training of his master, who directs his mind as to every phase of disease, and shows him how to do everything necessary, he sees and becomes familiar with every change and character of disease ; it habituates his mind and his intelligence to his professional duties. In this way he becomes familiar with the principles of medicine and the principles of surgery, and *it is the only way* he can acquire the special knowledge. This is professional education, and will make him in after life a competent and skilful veterinary surgeon. Book-learning can never give him this special knowledge. It is a knowledge that high classical education can never give him. The youth, however well grounded in French and Latin, will never gain it from those sources. *It is a knowledge more valuable than culture can give.* This is practical instruction, and being thus taught, it is found that such men do the right thing in the right way. They go about their patients and perform all minor as well as serious operations with ease and successfully in a business-like manner and with a practised hand. These, I maintain, are the men who simplify everything, and bring credit on the profession. I care not what professors and eccentric individuals say to the contrary, employers feel confidence and satisfaction in them, and a respect for the profession is created and established. I grant you that every one who has served an apprenticeship does not excel ; there are some men of mental deficiencies, but they are far more likely to be the better for it. Mr. Stevenson says that to an "exceptionally intelligent youth a twelve months' pupilage is ample," but even to this youth three years would be better. I have always maintained, both in the council and at the association meetings and in my writings, that to a student thus taught and thus experienced, two sessions at college is amply sufficient. He can learn everything that is necessary of college teaching in that time : a longer period is so much lost time ; its tendency is to make him a worse practitioner. I do not say that he gets into a rule-of-thumb groove, but he gets into a clean-fingered groove which sticks to him more or less throughout his life. The eminence to which a man reaches is in a great measure dependent upon the natural character of the individual's mind. All men with practical minds discourage worthless delusions and scrupulously scientific contentions about the perfectibility of science, neither do they mystify their minds with visionary notions. They study to acquire knowledge of direct practical use ; they show a capacity and willingness to work with both brain and hand. There are some fine intellects in our profession who are so wholly absorbed in the idea of classical education and scientific education in our profession that it would seem they would deride and ignore work ; they deride and ignore the labour necessary to obtain the true knowledge which is specially required in our profession. They dream bright dreams and see great visions of what might be, but who, for the want of the needful labour, pass away from the profession still dreaming.

Third Class.

I now approach the third and last division of my subject, viz., those practitioners who possess a high classical education, but who have little or no practical knowledge. It would seem to be the rage amongst a certain class of educated people to worship anything and everything that takes the name of science ; *it is their idol*, it is the almighty lever whereby we must attain to the highest realms of knowledge. I should say that culture is the possession of that knowledge most appropriate to the condition of the life of

the individual; culture certainly means something quite different from learning or technicalities. Some hold that the man who has learned French, Latin, and Greek, however little, especially if he has obtained the university degree, has been educated. Until recently we could only attain to a higher knowledge through a Latin grammar. Modern literature has changed all this. I make bold to deny that literature and classical education alone is competent to supply the special or veterinary knowledge required in our profession, and further, if carried to an excess, is a mistake and is worse than useless in our profession. Every Englishman has in his native tongue an almost perfect instrument of literary expression, and in his own literature models of every kind of literary excellence. I can understand applied science, which consists in deductions from general principles and observation; no one can safely make these deductions until he has a firm grasp of the principles, and he can obtain that grasp only by personal experience and personal application. The value of practical experience is known only to those who are of mature age, who can estimate it and appreciate it. So great was the importance attached to this, that the Council in 1844 had a bye-law to the effect that "no person entering the Veterinary College of London, or Edinburgh, or such other Veterinary College as may be sanctioned by charter, on or after the 1st January, 1845, shall be admitted a member, or be eligible for examination by the Board of the Royal College of Veterinary Surgeons, until he has attained the age of twenty-one years." And at a late meeting of Council we confirmed a new bye-law that "no student shall receive his diploma until he has attained his twentieth year." Our Charter, we believe, gives us ample power to insist upon this.

But let us approach this question as close as we can. Has the member of our profession who has the advantage, as it is called, of a high classical education, and who has missed practical teaching in his youth, been more successful either at college or in business than others? Does he shine in the profession? Is he taken to be the professor's right-hand man in the clinical work at the college? Does he carry away the medals? Is he preferred as a judge of stock at agricultural shows? Will his scientific thought cause him to excel in the sick-box in a complicated case of chest influenza? I answer no, a decided no; in none of the subjects does he equal, nor can he compete with, the member who is intelligent and has been diligent and seen practice in his youth, provided always that the latter has good commonsense and has had a good English education. Professors and eccentric individuals may say what they will, but I am quite convinced that there is a sort of scientific knowledge, unless qualified with practical training, of no real utility to him in his business. Have we not the convincing evidence of the late Mr. John Wilkinson, and also his successor, Mr. James Collins, showing the lamentable ignorance of educated and gentlemanly men in innumerable instances—gentlemen highly educated and who have got their diploma, but who are utterly incompetent to be intrusted with sick or lame horses. These men are often indolent and indifferent, and are great failures; there is no redeeming feature in them, no silver lining in their case; they soon find their level; they flit about from place to place, doing no good anywhere, being conscious that they are failures, and after living in genteel poverty for some time they quit the profession in disgust and turn their attention to something else. We next find them following the occupation of horse dealer, cab proprietor, hotel-keeper, or possibly a teacher, or canine doctor.

> "The wise and active conquer difficulties
> By daring to attempt them; sloth and folly
> Shiver and shrink at sight of toil and danger,
> And make the impossibility they fear."

It is these men that entail disgrace and disrepute upon the character of our profession; it is these men who make our profession a laughing-stock to many, a disgrace to the college at which they have matriculated, and cast dishonour upon the Royal College of Veterinary Surgeons for having granted them a diploma. It is they who enable the non-qualified man to live and prosper. I consider it nothing less than absolute ruin to the character of our profession as a useful and honourable calling if this course is continued. In this view Mr. George Fleming is entirely with me. The defect of the present education of the student is inefficiency of practical training. The third session at college, which was intended to be devoted entirely to the teaching of practice, is not attended with the slightest advantage in that respect. I very much question whether three sessions at college by the above class of students are sufficient—nay, my private opinion is, that only in rare cases can the teachers (whether they be professors or private practitioners) ever mould them into useful men. At this very moment the high educational test of the intending student at his preliminary examination at the Royal Veterinary College is found impracticable, and the governors have found it absolutely necessary to make a retrograde movement, and reduce their high standard of education exacted from the student. More than half, if not two-thirds of the students were rejected at the opening last November.

The other night Mr. Collins, the Principal Veterinary Surgeon to the Army, stated publicly in the Council that of the young gentlemen who applied to him for appointments or a commission in the army, *more than half of them* are unable to tell which foot the horse is lame on, and one of them informed him that he had never put a hobble on a horse in his life, and could not do it if his life depended upon it. These men understood the principles of medicine and the principles of surgery, but were in ignorance of the commonest duties in practice. Is this, I would ask, likely to give satisfaction to our employers, or raise the status of our profession? The late Mr. John Wilkinson was always talking of this learned ignorance—the lamentable failures of gentlemen in ignorance of practice. I will give one as an example of all the rest. A gentleman of superior education and manners applied for admission. In conversation, reading, writing, and arithmetic he was faultless; his knowledge of the principles of medicine and the principles of surgery was entirely satisfactory; he was then shown a lame horse: the degree of lameness as he trotted past him was so great that Mr. Wilkinson felt somewhat ashamed to let it be looked upon as a test; but, strange to say, the three sound limbs were severally fixed upon as the lame limb. Then Mr. Wilkinson pointed out to him that on the other foot, a hind one, he had a leather sole on and tow hanging out slovenly, obvious to any one. He was then asked to take up the hind foot; he approached the horse from behind with hand and arm extended, made straight at the fetlock, when Mr. Wilkinson interposed, and said if he knew no better than that he would not only make a laughing-stock of himself, but would some day, in all probability, get his brains knocked out. Is this, I would ask, the sort of character likely to give satisfaction to our employers, or raise the status of our profession? I remember a very nice, smart, gentlemanly person applying to me for a situation: in conversation I was much pleased with him—well educated, good address, thoroughly conversant with the principles of medicine and the principles of surgery; he had qualified, and I thought he would be an acquisition to me. I invited him to accompany me to see some cases: first case, one of fever, he made a careful and prolonged examination, and diagnosed very incorrectly. I requested him to administer a draught; he got the cord in the mouth, head elevated, then he took firm hold of the tongue, drawing it forcibly out of the mouth with the left hand, while at the same time he attempted to pour the medicine down the throat with his right

hand: I interposed. The next case was a lame horse; I took the shoe off, gave exit to some matter, tacked shoe on, and passed on to the next case. I requested him to take off the shoe, a hind one: a quiet, light-bred horse; he said he should be most happy to do so; he then placed the hind foot between his own legs to enable him to unclench the nails; presently the horse made a pitch, sending him sprawling in the gutter, the groom and attendants laughing fit to split their sides at him. Now, I again ask, is this a satisfactory state of things? These are instances of giving theory and science first, and practice last. When they stand up in the battle of life they prove themselves utter failures. I know that the teachers of each college are for this kind of teaching. This no one need wonder at: their cry is, Numbers of students, numbers, numbers. Many of us are quite satisfied that it is utterly wrong in principle. Is it not a ludicrous misnomer to call it efficient teaching? And I would ask this meeting, I would ask the whole of my profession, are the colleges to dominate the profession, or is the profession to assert its power and declare its determination that this fallacy shall exist no longer, and that the apprenticeship system, either voluntary or obligatory, must and shall be carried out for one or more years? Let us be alive to the gravity of the situation, let there be no doubt what is our duty, or about our resolution to perform it; we should think and act all together on this point. I will not put another figure in the above picture, but only relate what a learned professor from the London College said to me at one of the baronet's banquets; getting upon this subject, he observed, "Notwithstanding we have a greater number of professors, and each subject more deeply taught than ever before, I feel no hesitation whatever in saying that we turn out a less percentage of practical men now than we did fifteen years ago." Is this not very unsatisfactory and demands a radical change?

I could name five or more teachers, either present or past, who stood pre-eminent as lecturers; they may be said to be giants each in their knowledge of scientific subjects, principles of medicine, principles of surgery, etc., etc., but in each case the principal of the college at which they were individually lecturing said to me, "You will think it strange, although he is so extraordinarily clever, I cannot send him out to treat the most simple case; he seems as if he could form no idea of what is the matter with his patient." Now I again ask, Is this satisfactory? are we justified in getting a penal clause to protect and support these men in their blunders when they go into general practice?

Mr. Stephenson says "he who cannot hold his own against the poor, illiterate, non-qualified man, is unworthy of protection." The young man who has served three or four years' apprenticeship, working from morning until night amongst sick and lame horses, would not make such blunders. I am more and more convinced that the only way we can arrive at a satisfactory solution of this difficulty is for us to make a hard and fast line: the possession of practical knowledge must be made an absolute necessity. But the colleges tell us these apprenticeship-students are the worst students: this every sensible and experienced man must repudiate. We have seen some instances of what their teaching produces without this practical teaching; but how can it be as they say, that the youth is filled with empirical and antiquated notions, when the apprentice has none but modern works to study, and his master may be fresh from the classic ground of Camden Town, Edinburgh, or Glasgow? He could have instilled into his mind no notions but those taught at the colleges, and besides, he gets the thorough ground work in the business of his calling, is handy in his work, and acquires business habits. But the sad fact remains, and who is to blame for this disgraceful state of things? I say it is not the colleges, it is not the examiners, but the responsibility rests with the Royal College of Veterinary Surgeons for granting diplomas to such men. What concern is it to the

schools, if only the student passes and gets away. I say the profession was not made for the schools, but *vice versa*, and it is for the profession to assert its own authority and insist on it, that in addition to a severer searching practical examination, there must be an apprenticeship education as a sort of adjunct to college teaching, or collateral security that the youth must know his profession practically and efficiently.

I have seen this question put to the vote at several Veterinary Medical Associations, and the answer has always been a large majority, sometimes it was unanimous in favour of the apprenticeship or pupilage system of education. At the late meeting of the Southern Counties Veterinary Medical Association, held at Tunbridge Wells, the vote was unanimous in favour of it, and at the annual meeting of this year there were seven votes against and seventy votes in favour of apprenticeship or pupilage training; and at a late meeting of Council, our President, Mr. Fleming, carried his motion by all but a unanimous vote for one year's apprenticeship as a condition of the student's eligibility to be examined for a diploma, on and after 1884. Surely there is a significance in all this, and I ask, nay, I hope and pray, that the profession will insist that this be faithfully carried out.

We are asked in letters in the October number of the VETERINARY JOURNAL, "Are there no men in the profession whose practice is radically bad?" I answer, Yes, plenty who belong to my first and third class of practitioners, whose example would be worse than useless. Then we are asked, "What is to prevent such men from taking pupils?" I answer, The best of all reasons: *no one would place their sons with them.* Then further on we are found great fault with if we let out the secret to the youth of sixteen or eighteen years old that he will be expected to gain his livelihood by his profession—an enterprise, by-the-by, that few of my third-class practitioners have made themselves conspicuous in doing. These writers seem to think that it is necessary that a great variety of extraneous matter must be mixed up and learned by the student; but I would say to them on this point, as the Great Teacher said to the woman on another point, "Martha, Martha, thou art careful and troubled about many things, but one thing is needful."

AN UNWARRANTABLE INTRUSION.

SINCE the invasion of Cattle-plague in 1865-66, when medical men in this country caused such terrible loss by misleading agriculturists and the public as to the nature of the disease and the means to get rid of it, we have happily had but few occasions to find fault with them for meddling with matters belonging to our profession. As a rule, they are ready nowadays to confess that they know nothing of the diseases of animals, and are generally only too glad to glean information with regard to them. It is universally known, strange though it may seem, that no body of men know less of comparative pathology than doctors, and this ignorance is leading to a strong outcry for the institution of chairs at the universities and medical schools to instruct medical students in this subject. Unfortunately, ignorance does not always act as a deterrent upon certain individuals, whose audacity and lack of professional decency far exceed their acquaintance with matters upon which they presume to give an opinion. One of the most conspicuous instances we ever met with of bad taste, insolence, and ignorance combined has just occurred, and we are certain we are doing the medical profession a service in exposing it, in order that they may sit upon the unmannerly individual; for there can be no doubt he is as ill-bred with members of the medical as the veterinary profession, when he has the opportunity, which we trust is but seldom.

We know nothing of "J. M. Cunningham, Esquire, Surgeon-General with

the Government of India," as he is dubbed in a paper now before us. His name, we fancy, is but little known beyond his own immediate circle—at any rate, we never heard of it, and we know pretty well all the medical men who have done anything to raise themselves beyond the level of dull mediocrity. Therefore if we are now compelled to become acquainted with it, and to publish it to the world, we do not venture to do so in terms of praise, but rather of condemnation, and as a warning to medical men and veterinary surgeons in India who may fall under his criticism. All they have to do is to show how he has behaved in the following instance, and then they will be safe from the effects of his impertinent and offensive remarks.

There is now publishing in this Journal a paper from the pen of Dr. Evans, Veterinary Inspector in India, on the fatal disease called "Surra," which he was specially sent by the Government of India to investigate, and for the report on which he received the thanks of that discovery. As will be seen by his paper, he discovered a worm in the blood of the affected horses, which he believes to be the cause of the disease; and it would appear that the Government of India, from some inexplicable reason, referred his report to this Surgeon-General, or the latter may have offered to give an opinion on it, which is much more likely. However this may be, the opinion was given, and here it is, dated April 20th, 1881:—

"I do not think that further inquiry by a veterinary surgeon is likely to lead to any useful results. Very few of them have the necessary scientific qualifications. Dr. Evans had them to a much larger extent than usual, but even he was led away to hurried conclusions. It is by no means proved that the parasite he observed is the *cause* of 'Surra,' for it is identical with a parasite which Dr. Lewis discovered in rats, to all appearance in perfect health. Moreover, like parasites have, Dr. Lewis informs me, been quite recently found in the blood of healthy *hamsters* (a species of rat) in Germany. Without much stronger evidence than has yet been adduced it can hardly be credited that the parasite should give rise to fatal disease in the horse, mule, camel, and dog, and yet be harmless in the blood of other animals. It appears therefore premature to say that even a 'clue' has been found to the cause of 'Surra.'

"But although I would not advocate further scientific investigation by a veterinary surgeon, I would strongly recommend practical action being taken to improve the sanitary condition of the places where the horses in frontier stations subject to 'Surra' are kept. Among these improvements may be specially mentioned:—

(*a*) Avoidance of overcrowding. Each horse should have abundant space and pure fresh air.

(*b*) To secure the latter there should be scrupulous cleanliness in surroundings and in the ground on which they stand. This should be dug out occasionally to the depth of two feet, and fresh earth substituted.

(*c*) The water-supply should be improved and made as perfect as possible.

"If these improvements are carried out, much will have been done to prevent 'Surra' and other diseases also. The work does not require a veterinary surgeon, for it can be carried out by the officers and non-commissioned officers of the regiment."

It will be observed that this Surgeon-General has nothing but condemnation for not only Dr. Evans, but the entire veterinary profession, and does not even admit the discovery of the "parasite," as he terms it, in the blood of horses and other animals, though it had never been described in them before, to be of any consequence. Such a man must be as dead to shame as

he is deficient in knowledge and good taste, else he would never have penned such a disgraceful effusion. His presumption and audacity in recommending sanitary precautions which are known to the veriest tyro in India, and at the same time maligning veterinary surgeons, is an example of the kind of individual which one used to meet with in the medical profession rather often in days gone by, but which we had hoped had become extinct.

We would caution the Indian Government against consulting Surgeon-General J. M. Cunningham in veterinary matters, or placing any reliance on his opinion. If it does, there need be no difficulty in predicting what the consequences will be. In this country medical men are no longer consulted with regard to animal diseases: "A burnt child dreads the fire." India will suffer still more if it listens to such men as Surgeon-General J. M. Cunningham.

THE BRITISH NATIONAL VETERINARY CONGRESS.

THIS Congress, held in London on July 20th and 21st, was a brilliant success. Held in the beautiful and commodious rooms of the Society of Arts, the meeting was remarkably well attended by members of the profession not only from England, Ireland, and Scotland, as well as the Army, but also from our Colonies. The presidents of the Southern Counties, Eastern Counties, Midland, Yorkshire, and North of England Veterinary Associations were present, as well as a number of medical men and visitors. The President of the Royal College of Veterinary Surgeons performed the duties of President of the Congress, and the proceedings during the two days were of the most interesting character, and carried out perfectly and methodically, thanks to the excellent arrangements made by the Secretaries.

The Congress excited a good deal of interest in London, and the public press noticed its discussions with much favour and encouragement.

A banquet was held at the Horse-shoe Hotel on the evening of the 20th, at which a large gathering took place, the President in the chair.

Altogether, the Congress proved to be the most successful meeting ever attempted in this country by the veterinary profession, and on this account, as well as the public interest manifested in it and the benefits likely to accrue from it, it was resolved at the last day's sitting to hold a congress every third or fifth year.

After paying all expenses, it is estimated that a handsome balance will be left to hand over to the building fund of the Royal College of Veterinary Surgeons.

A more detailed account of the proceedings must be deferred until our next issue.

NEW MEMBERS OF THE PROFESSION.

AT the meetings of the Court of Examiners of the Royal College of Veterinary Surgeons, held in London on the 4th July, the following students from the Royal Veterinary College were admitted members of the profession:—

Mr. Chas. J. Vyner	... ...	Tufnell Park, London.
„ Wm. F. Barrett*	... ...	Wisbeach.
„ H. Redford	... ...	Winchester.
„ E. H. Scott	... ...	York.
„ A. E. Barlow	... ...	Reading.
„ H. H. Roberts*	... ...	Kenilworth.

The following students passed their Second Examination at the meetings of the Court of Examiners on 5th July:—

Mr. J. Chaplin.
„ C. H. Williams.
„ A. E. Michell.
Mr. J. J. Dawtrey.
„ Chas. Hartley.
„ D. M. Barry.

The following passed their First Examination at the meetings of the Court of Examiners on the 6th, 7th, and 8th July :—

Mr. J. T. Twiss.
„ S. J. Marriott.*
„ J. G. Parr.*
„ E. H. Hazleton.*
„ C. W. Page.*
„ H. L. Somers.
„ A. J. Proctor.
„ J. V. Daly.*
„ W. F. Shaw.
Mr. E. F. O'Toole.*
„ W. H. Bloye.*
„ G. W. Beck.
„ H. J. Axè.
„ E. P. Evans.
„ T. E. Baker.
„ Robt. Hill.
„ S. J. Blanchard.
„ Chas. Morgan.*

* Marked thus passed with Great Credit.

THE FELLOWSHIP DEGREE OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

An examination for the Fellowship Degree of the Royal College of Veterinary Surgeons took place on July 22nd, when the following gentlemen had the honour of being elected Fellows :—

J. J. Meyrick, Army Veterinary Department.
G. A. Banham, Brown Institute.
E. Stanley, Warwick.
G. A. J. Muir, Inspector, Privy Council, Ireland.

The written questions were as follows :—

Pathology.

1. Give the pathology and pathological anatomy of purulent infection.
2. Describe Diphtheria, its relations to croupous inflammation, and the differences between the two morbid conditions.
3. What is the pathology of so-called Purpura Hæmorrhagica?

Epizoötiology.

1. Describe the measures to be prescribed, in an uninfected country, against the introduction of Swine-plague and Contagious Pleuro-pneumonia.
2. When were the earliest outbreaks of Cattle-plague recorded, and what was their ordinary geographical course?
3. How are Canine Distemper, Rabies, Foot-and-Mouth Disease, and Glanders extended over a country?

Sanitary Science.

1. State what insanitary and dietetic conditions favour the development and spread of the disease known as *Sheep-rot*.
2. State what sanitary remedies you would adopt to arrest the spread of *Pleuro-pneumonia* in cattle.

Dietetics.

1. Give the chemical composition of *beet*, *mangel-wurzel*, and *turnip*, and state their relative merits for feeding purposes.
2. State your reasons for, or against, the use of *cooked food* for working horses.

Surgery.

1. Describe the *ecraseur*, and its advantages and disadvantages in the removal of tumours.
2. Describe the *thermo-cautery* and the *nasal insufflator*, and their uses.

Comparative Anatomy.

1. Describe the general arrangement of the bones of the anterior extremity in mammalia, and state the differences observed in birds.
2. Describe the arrangement of the respiratory organs in mammals, birds reptiles, and fishes.

Physiology.

1. Enumerate the different forms of secreting glands, and give an example of each; describe the process of secretion, and state by what conditions it may be increased, diminished, or arrested.
2. Describe the origin, distribution, and function of the superior maxillary division of the trifacial nerve.
3. What is the specific gravity of the urine of the horse? State its chemical composition, and point the differences observed in the urine of carnivorous animals.

Therapeutics.

1. What are the therapeutic actions of nux vomica, aconite, and opium? and state the conditions which indicate their administration.
2. What therapeutic measures would you adopt in outbreaks of Influenza among horses and Enzoötic Hæmaturia among cattle and sheep?

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL, HELD JULY 1st, 1881.

G. FLEMING, Esq., President, in the chair.

Present: Professors Brown, Pritchard, Robertson, and Walley; Messrs. Morgan, Dray, Simpson, Cartwright, Woods, Greaves, Harpley, Taylor, Coates, Dun, Whittle, Cox, Batt, Reynolds, Wragg, and the Secretary.

The SECRETARY read the notice convening the meeting.

The minutes of the last meeting were read and confirmed.

The SECRETARY announced the presentations to the Library and Museum:

(1) From the President, "On Human and Animal Variola," and "The Principles of Horse-shoeing."

(2) Also various books and pamphlets from Professors Siegen and Buonsanti.

(3) From Mr. Beckett, of Sheffield, a diseased shank-bone.

On the motion of Mr. DRAY, seconded by Mr. TAYLOR, a vote of thanks was accorded to the respective donors.

Letters were announced from Professor Williams, Mr. Blakeway, and Mr. Gowing, regretting their inability to attend the meeting; and from Messrs. Harpley, Dray, Reynolds, Taylor, Walley, Cox, and Cartwright, acknowledging the honour of their election on the Council.

A letter was read from R. P. Lord, stating that he had lost his diploma and his Highland Society's certificate, and wishing to know if he could be supplied with a duplicate diploma.

On the motion of Mr. TAYLOR, seconded by Mr. MORGAN, it was decided that inquiry should be made as to how the diploma was lost, and as to Mr. Lord's identity.

A letter was read from the Secretaries of the British National Veterinary Congress; and one from Mr. Morgan, giving notice of his intention to move a resolution with regard to the appointment of examiners.

Mr. MORGAN said he thought the subject should have been mentioned in the summons paper.

After some discussion as to whether the proposal would necessitate an alteration of a by-law,

Mr. MORGAN stated that what he wished was simply that the matter should be submitted to the consideration of the Examination Committee.

The diplomas of the following gentlemen, holding certificates of the Highland and Agricultural Society, were signed by the President:—Messrs. H. G. Robinson, W. Fleming, R. Willmot, J. Aitken, jun., J. W. H. Ashe, F. E. Rice, and H. Tait.

The SECRETARY read the Report of the Examination Committee.

The PRESIDENT said the opinions of the principals of the different schools had been obtained with regard to the proposals of the Examination Committee, and there appeared to be very little difference indeed, except as to the number of marks and the date at which the examination should commence. He thought it would be advisable for the Examination Committee to again meet and consider the subject, and report to the next quarterly meeting of the Council.

After some conversation this course was agreed to.

The SECRETARY read the report of the examinations in Edinburgh and Glasgow, and the report of the Finance Committee.

On the suggestion of Professor PRITCHARD, the following instruction was directed to be sent to the Examination Committee:—"That the Examination Committee take into consideration, in the case of a candidate presenting an education certificate, what length of time should elapse between his obtaining such certificate and the date when he presents himself to the R.C.V.S., and further, that such period should not exceed seven years."

On the motion of Mr. WHITTLE, seconded by Professor PRITCHARD, the Finance report was received.

Mr. WOODS proposed, and Mr. BATT seconded, the adoption of the Finance report.

Mr. TAYLOR gave notice that at the next quarterly meeting he would bring forward the subject of the dates at which the functions of the Finance Committee began and terminated.

The report was then adopted.

Messrs. Fleming, Pritchard, Axe, and Coates were re-elected as the Museum Committee, on the motion of Mr. HARPLEY, seconded by Mr. TAYLOR.

Mr. REYNOLDS proposed, and Mr. BATT seconded, the reappointment of the Finance Committee, which was agreed to, and on the suggestion of Mr. Dray the name of Mr. Wragg was added to the list.

The House Committee, consisting of Messrs. Batt, Greaves, Harpley, and Pritchard, was reappointed, with the addition of Mr. Coates.

The names of Mr. Fleming, Mr. Coates, and Mr. Collins having been suggested for re-election on the Registration Committee,

The PRESIDENT said that, in view of future events, he thought the Registration Committee should be increased in number. He anticipated that they would have a good deal of business to attend to in the next twelve months.

The names of Messrs. Robertson, Wragg, Pritchard, Dun, and Simpson were added to the list, and the committee was then reappointed.

Messrs. Axe, Blakeway, Harpley, and Robertson were elected members of the Library Committee.

The Parliamentary Committee was reappointed, with the addition of Messrs. Dun and Simpson.

The PRESIDENT announced that the general examinations would commence in London on Monday, July 4th, and the examinations for the Fellowship about the 21st or 22nd.

Mr. MORGAN asked what fees were paid to the examiners.

The SECRETARY explained.

On the motion of Mr. WALLEY, seconded by Mr. DRAY, Messrs. Fleming, Collins, Duguid, and a member of the College of Preceptors were elected examiners.

The SECRETARY read the report of the Fitzwygram Examination. The first prize was awarded to Mr. W. W. Dollar, of the Clyde Street School.

Mr. MORGAN said he should like to know what the Council had to do with the Fitzwygram prizes. They did not appoint the examiners, and the College ought not to be troubled with the report.

Mr. WHITTLE complained of the manner in which the arrangements for the examination had been carried out.

Mr. HARPLEY said that when General Sir Frederick Fitzwygram first introduced these examinations the Council were aware of the responsibilities, and allowed Sir Frederick to appoint the examiners. If any gentleman objected to the mode in which the examinations were conducted he might give notice, and have the matter fully discussed.

Mr. WOODS said he understood that the Clyde Street School was the only one that knew that the examination was taking place. His own son, who was at Gayfield Square College, had no intimation of it.

The PRESIDENT said the examination was announced in the *Veterinarian* and the VETERINARY JOURNAL.

Mr. WOODS gave notice that he would bring the question forward at the next quarterly meeting.

Mr. WHITTLE asked who fixed the time and made arrangements for the examination in Edinburgh.

The SECRETARY said Sir Frederick made his own arrangements.

The SECRETARY, as Registrar, read the obituary notice.

Mr. WALLEY asked if anything had been done with reference to the question discussed by the Council some time ago as to the pupilage question.

The PRESIDENT said he submitted a case to the Attorney-General some months ago, but that gentleman had been busily occupied ever since. No doubt, however, he would attend to it before long.

Mr. DRAY asked the President if he could give the Council any information respecting the Veterinary Surgeons Bill.

The PRESIDENT said, with regard to a certain case, it was decided that the Attorney-General at the Cape should be written to for the facts, and that the editors of two papers should also be applied to. No time had been lost, because if the opinion of the Cape Attorney-General had been received it would be no use acting upon it at once. However, it had not yet been received. With regard to the Veterinary Surgeons Bill, the Council were aware that it had been presented to the House of Lords by Lord Aberdare, who, on the second reading, did ample justice to the subject. It was very favourably received by Lord Spencer, and, in fact, by the House of Lords generally. The Bill was opposed by the Duke of Marlborough and the Marquis of Salisbury, who appeared to do so on behalf of the Highland Society. The Lord President said that if Lord Aberdare would consent to certain amendments he would give the Bill his hearty support, and it passed the second reading. At a later period he (the President) received infor-

mation that a change was about to be made in favour of unqualified men, and, as there was no time to call the Council together, he wrote to the presidents of the various local associations, to forward petitions. He also, as President of the College, sent a memorial to Earl Spencer, in order to impress upon him the necessity of protecting the title of Veterinary Surgeon. The appeal to the profession throughout the country was received most warmly. Within three or four days all the English associations, except one which did not receive the letter in time,* forwarded petitions, as well as the West of Scotland Society and the North of Ireland Society; and Mr. Simcocks, as a private individual, received for his petition the signatures of nearly all the veterinary surgeons in Ireland. The Royal Society for the Prevention of Cruelty to Animals also sent in a very urgent petition, begging that the title might be retained. In addition to all this, the students of the Royal Veterinary College sent a petition. The Bill passed in Committee, the Lord President's amendments being reserved until the Bill was re-committed. He (Mr. Fleming), Lord Aberdare, and Prof. Brown had a long interview with Lord Spencer, and, among other matters, urged very strongly upon him the necessity for exempting members of the profession from serving on juries. The Lord President did not receive the proposal very warmly, but Lord Aberdare there and then said that he would introduce a clause in favour of exemption. He (Mr. Fleming) strongly objected to unqualified men being placed on the Register as veterinary surgeons, but one of the first questions asked by Lord Spencer was, whether the College had ever taken any steps to justify its right to the title. Of course the only reply was that it had not. The unqualified men had secured an amount of sympathy and support which was perfectly wonderful, and their appeal had been irresistible, so that the Lord President proposed to put on the Register as members of the Royal College of Veterinary Surgeons those who had practised for five years. Of course it would have been ruinous to give them the designation of "members," and Prof. Brown and he strongly urged the necessity of altering the title. When the amendments were reprinted it was found that the term "licentiate" had been adopted—a term quite as damaging to the profession as that of "member." Everything that could be done was done to prevent this. With regard to the exemption from juries, the amendment proposed by Lord Aberdare was rejected by 19, but he hoped that when the Bill came before the Commons the exemption would be secured.

Professor BROWN said that when the Bill was referred by Earl Spencer to the Government legal adviser he, with the Clerk of the Council, attended the consultation, and the legal adviser, looking at Clause 3, said, "This will never get through the House of Commons: the exclusive title of 'Veterinary Surgeon' cannot belong to any number of persons belonging to a corporate body." The term "licentiate" was put in as the best that could be selected for those men who were not members of the College.

The SECRETARY read the petition which the President had forwarded to Earl Spencer in the name of the Council, and the Bill as it appeared in its present shape.

The PRESIDENT said the period during which the unqualified men must have practised had—on the motion of the Marquis of Salisbury—been reduced from five to three years.

Mr. TAYLOR strongly objected to legalizing a number of farriers, etc., simply because they had been in practice three years. He would be no party to passing such a Bill.

* This society, the North of England Veterinary Medical Association, we are informed by the President, did forward a petition. So that the only Society which did not respond to the appeal was the Scottish Metropolitan.—ED. *V. J.*

Mr. MORGAN said if the Bill became law the College would be entirely under the thumb of the Privy Council. He thought the profession would be far better without the Bill than with it.

The PRESIDENT said the Bill did not deserve the cold water that had been thrown upon it. It conferred immense advantages upon the profession, but the weight of argument in favour of the unqualified men was unanswerable. Two years ago the dentists had a Bill for their protection, and every druggist's apprentice, every apothecary's boy, every cow-leech it might be, who extracted a tooth, was put on the Register: the only distinction between the qualified man who had studied for years and the impostor was, that the one was designated a licentiate of dentistry, and the other a registered dentist; but they were all put on the same Register. In the Veterinary Surgeons Bill, however, the licentiates were put on another page of the Register. In the case of the dentists 5,298 persons placed themselves on the Register, of whom 483 were qualified dentists, fifty physicians and surgeons practising dentistry, 2,707 dentists without any qualification, and 2,049 druggists and druggists' assistants. The sanction of Parliament which the present Bill would give to the College was a grand thing to secure. Then, with regard to removal from the Register, it had been discussed several times for what causes a name should be struck out. The powers given by the Charter were so very wide that the Council could not act upon them; but the Lord President had, to a large extent, defined in what cases names should be removed, and by giving the person the right of appeal to the Privy Council he had placed the responsibility on the Privy Council. Then, again, the registration would be very complete, as every registrar of deaths would have to send into the College the name of any veterinary surgeon who died in his district, with the time and place of his death. Unqualified men were now increasing and disgracing the profession; but if the Bill became law that increase would at once cease. The admission of such men to the Register was left to the Council, who could impose registration fees and demand certain proofs, which might exclude fifty per cent. of them. The Bill would be the death-blow to imposture and quackery, for after the 31st December, 1883, none of those who were not registered would be able to sue in a court of justice for anything they had done in the way of the treatment of animals. For himself he considered that it was a splendid Bill, his only fear being that it might be altered in the House of Commons.

Mr. TAYLOR said he was disappointed with the Bill, because it made concessions to ignorant men, and allowed them to assume a position to which they had no right under the Charter of the College.

Mr. WALLEY approved of the Bill. It was impossible for the College to get all they asked for, and some concessions must be made.

Mr. DUN said, though he was somewhat disappointed in the matter of the short period which a man was required to have practised the veterinary art in order to be entitled to registration, he still considered that the Bill would give the College a sure position, which there was not much prospect of its otherwise attaining. The number of unqualified men who would assume the title of Veterinary Surgeon might be disagreeably large, but a very few years would diminish them, and the members of the College would then become the only recognized practitioners throughout the country. A man who falsely assumed the title of Veterinary Surgeon would be liable to a fine of £20. To whom would the fines go?

The PRESIDENT said in the Bill as committed the fines were to go to the College, but that was now altered.

Professor BROWN said the Treasury made the alteration. The expenses of prosecution would be borne by the county.

Mr. BATT said the Bill gave the College quite as much as he expected it would.

Mr. HARPLEY said even the Royal College of Surgeons had to take in all the men who were practising as surgeons and physicians from 1815. They found it to their advantage to agree to that, and surely the Royal College of Veterinary Surgeons ought to act in a similar manner. It would be a great mistake on the part of the Council not to go on with the Bill.

Mr. SIMPSON also recommended that the efforts to pass the Bill should be continued.

Mr. HARPLEY moved "That this Council highly approves of the Bill as at present before the Council."

Mr. GREAVES seconded the motion. Though the Bill did not give all that he could wish, it was the best that could be obtained, and therefore he thought it should be proceeded with.

The motion was agreed to.

Mr. DUN suggested that influence should be brought to bear upon Members of Parliament through the different Farmers' clubs.

Mr. ROBERTSON approved of Mr. Dun's suggestion.

The PRESIDENT said that he had already taken proceedings in that direction. In addition to that, as the Bill was introduced under the auspices of the Royal Society for the Prevention of Cruelty to Animals, all the members of that Society in the House of Commons would be asked by circular to support it.

Mr. WHITTLE proposed, and Mr. WHALLEY seconded, a hearty vote of thanks to the President and Professor Brown for their exertions in connection with the Bill.

The motion was agreed to, and the proceedings then terminated.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

A SPECIAL meeting of the Society was held at the Queen's Hotel, Leeds, on Saturday, the 18th June, the President, Mr. J. H. Ferguson, in the chair. The following members were also present; viz., Messrs. M. E. Naylor, J. S. Carter, J. W. Anderton, C. Patterson, Peter Walker, Parlane Walker, J. E. Scriven, W. G. Schofield, J. Tatam, and the Secretary.

The business before the meeting was the propriety of petitioning the Privy Council in aid of the clause "restricting the use of the title Veterinary Surgeon to members of the Royal College of Veterinary Surgeons and the holders of the certificate of the Highland Agricultural Society." After some discussion, it was unanimously resolved that a petition from this Society be forwarded to Earl Spencer requesting his support to the Bill as suggested. The petition was signed, either personally or by proxy, by almost every member of the Society, also several friends, M.R.C.V.S. The receipt of the petition was acknowledged by Mr. Peel, Clerk of the Privy Council; also by Mr. Fleming, President R.C.V.S.

The usual summer quarterly meeting was held at the Queen's Hotel, Leeds, on Tuesday, the 12th July, the President, Mr. J. H. Ferguson, in the chair. The following members were also present; viz., Messrs. Jas. Freeman, T. Greaves, J. S. Carter, J. W. Anderton, J. Tatam, Peter Walker, J. Atcherley, W. G. Schofield, W. Lodge, John Nettleton, H. Snarry, Jos. Freeman, G. E. Bowman, T. C. Toop, and the Secretary.

Apologies for non-attendance were received from Messrs. E. C. Dray, Jno. Freeman, J. M. Axe, F. Danby, and B. Smith.

The minutes of the previous quarterly meeting, and also of the special meeting, were read and confirmed. Mr. T. C. Toop, M.R.C.V.S., was nominated for membership.

The SECRETARY hoped the members would heartily support the Veterinary Congress. After some discussion regarding the very small objections entertained in some quarters to the exclusion of the certificated veterinary surgeons, and to the amount of the entrance fee, nine members paid their entrance fee.

The all-absorbing topic of the Veterinary Surgeons Bill was introduced by the SECRETARY, who read a letter that he had just received from the President of the College, stating his opinion upon the Bill as now amended by the House of Lords.

Considerable discussion took place regarding the admission of farriers, grooms, castrators, and cow-leeches under Clause 15, Messrs. Nettleton, Lodge, and other gentlemen being afraid that the country was about to be flooded with these pseudo veterinary surgeons.

Mr. NETTLETON said the clause admitting quacks of five years' standing ought to be strenuously opposed.

Mr. SCHOFIELD and other gentlemen thought the words "licentiate of the Royal College" ought not to be granted to these men.

Mr. GREAVES made some remarks upon the early compiling of the clauses of the Bill, and proceeded to explain that the Privy Council and the Council of the R.C.V.S. would enforce certain regulations as to the reputation, character, and general conduct of these candidates before granting them the certificate to practise as veterinary surgeons.

The SECRETARY suggested the substitution of the words *ten years* in lieu of *five years*, in Clause 15 (1), and

Mr. TATAM suggested adding the words after veterinary surgeons, "and has assumed the title of Veterinary Surgeon."

These alterations appeared to meet the views of all the gentlemen present; and a resolution, proposed by the SECRETARY, and seconded by Mr. ATCHERLEY, was unanimously adopted, recommending the Council of the Royal College to give their due consideration to these questions.*

Mr. LODGE exhibited the bones of the neck of a pony which had been cast in its stall, causing laceration of the ligaments of the second and third cervical bones, followed by osseous deposition. He also exhibited a specimen of peculiar disease of the mucous membrane of the bowels.

The subject of the best treatment for Purpura Hæmorrhagica was introduced by Mr. JAS. FREEMAN. Messrs. GREAVES, TATAM, and TOOP expressed their views upon the subject.

Mr. NETTLETON related a case of amputation of the fore leg of a heifer below the knee, applied an artificial leg, and the animal has quite recovered. Has been successful in treating two or three fractures in the horse.

The treatment of capped elbow was introduced by Mr. TATAM. Had operated upon a big draught horse lately. The wound was unhealthy, with a fungoid growth.

Mr. GREAVES said he had amputated several of these tumours; and where fungus sprung up he recommended the application of Potassa Fusa freely to the diseased surface.

Mr. SCHOFIELD related three cases of disease in mares about the time of parturition. There was enormous swelling of vagina, with inability to rise, etc. Two cases were down upon my arrival, and died in a few hours. The third case was upon her legs when I saw her. I kept her in that position, and she foaled all right, and thoroughly recovered.

* Clause 15 (1): "Where, at the passing of this Act, any person practises and has continuously for not less than *ten* years next before the passing of this Act practised veterinary surgery in the United Kingdom, but is not on the Register of Veterinary Surgeons, *and has assumed the title of Veterinary Surgeon*, he shall be entitled," etc., etc.

Messrs. CARTER and NETTLETON had seen similar cases. Had administered powerful stimulants, and the cases recovered.

Mr. JNO. NETTLETON has kindly volunteered to read a paper for discussion at the next meeting. W. BROUGHTON, *Hon. Secretary.*

THE NORFOLK AND EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

ON Tuesday, July 5th, 1881, the Norfolk and Eastern Counties Veterinary Medical Association held the usual half-yearly meeting at the Norfolk Hotel, Norwich, A. H. Santy, Esq., F.R.C.V.S., President, in the chair.

H. J. Cartwright, Esq., F.R.C.V.S., and Thos. Greaves, Esq., F.R.C.V.S., were present as visitors; and amongst the members present were Messrs. F. Low, Norwich; G. G. Whincop, Norwich; W. Shipley, Great Yarmouth; H. Newson, Beccles; E. Barker, St. Faith's; J. H. Carter, Litcham; A. G. Banham, Wandsworth; J. E. Anger, Wymondham; J. Hammond, Bale; W. J. Bower, East Rudham; J. K. Gooch, Holt; J. Hammond, jun., and J. D. Overed, Blofield (Hon. Sec.). Letters regretting their inability to attend were received from Gen. Sir F. Fitzwygram, Bart.; George Fleming, Esq. (President R.C.V.S.), and others.

The treasurer's accounts and the minutes of the last meeting having been received and adopted, the following gentlemen were unanimously elected members of the association: Mr. W. H. Hinde, M.R.C.V.S., Downham Market, and Mr. A. Willows, M.R.C.V.S., Norwich.

The PRESIDENT then addressed those present as follows:—Mr. Vice-President and Gentlemen, in opening this our seventh meeting since the resuscitation of the Norfolk and Eastern Counties Veterinary Medical Association, I think you will agree with me that we have good cause for congratulation. We have proved ourselves to be a power, however small. The present worthy president of our profession is our especial nominee. Many things suggested by us some years since for the good of veterinary science have now become realities, and others are rapidly tending in that direction. I refer to certain clauses in the Contagious Diseases (Animals) Act, the Penal Act, and the Apprenticeship Clause. As a body we have been appealed to to raise our voice in support of our just claim to the title of "veterinary surgeon," and which has been so unjustly filched from us by pretenders and others. Acting on your behalf, the Hon. Sec. and myself, at a moment's notice, memorialised Her Majesty's Government, through Earl Spencer, that the Veterinary Surgeons Bill of 1881 might pass in its entirety, or at least without being so mutilated in Committee as to become useless and inoperative. Some of the resident nobility, and the members for the city and county, have also been interviewed, urging them to support the Bill, and to use their influence on our behalf. There are many clauses in this Bill which would afford us ample subject for discussion, but we have not the time at our disposal; and my object in submitting these facts is to acquaint you with everything that has been, or is being, done by us on behalf of the association, and which we trust you will approve. I believe our association is doing good in other ways, by binding its members closer in one common brotherhood, and showing that no man should live for himself only, but for others also. Thus I think it most necessary that those who are at present outside its pale should be brought in, while the present members should double their efforts to promote the objects of this association by writing, or otherwise communicating, facts and matters of practical interest to their brethren, and so to benefit the profession generally. I feel certain that I am expressing the sentiments of every individual present by conveying our heartfelt thanks to Geo. Fleming, Esq., the present dis-

tinguished head of the veterinary profession, for his untiring zeal in promoting its best interests, and especially his noble efforts to ensure the passage of the Veterinary Medical Bill through the Houses of Parliament in such a form as to make it a reality and a lasting blessing to all concerned.

The President then requested his warm and attached friend Mr. Greaves to read his paper on the "Penal and Apprenticeship Clauses," which had been so well received in other parts of the kingdom.

The paper proved to be a very elaborate and interesting one; its reading was listened to with marked attention, and at its close an animated discussion followed, in which the President, Messrs. Cartwright, Banham, Shipley, Carter, Hammond, Whincop, and others, took part, all concurring in the main with the views of the essayist; and when, at the request of Mr. Greaves, the President put the question, yea or nay, every hand was held up in favour of it.

The subject of the British National Veterinary Congress, to be held in London on the 20th and 21st inst., was next introduced by the President, in favour of which he spoke strongly as being a step in the right direction, and calculated to promote the best interests of the profession, which he believed they all had at heart. Mr. Overed (the local secretary) would be glad to receive subscriptions in aid of the Congress, and to give any information in his power respecting the same. He (the President) intended to be present at the Congress sittings, and he should feel much gratified by seeing their association well represented there, when he felt sure they would receive a hearty welcome.

The proposed alteration in the Veterinary Surgeons Bill was next considered, which the members present strongly protested against; but as they have every confidence in Mr. Fleming's loyalty and judgment, they felt it would be best to leave the matter in his hands, feeling sure he would obtain the best terms possible for them.

A cordial vote of thanks was then accorded to Mr. Greaves for his great kindness in being present, and for his interesting paper; also to Mr. Santy for his able conduct in the chair. Both those gentlemen suitably acknowledged the compliment, and the meeting terminated by the members taking tea together. JOHN D. OVERED, *Hon. Sec. and Treasurer.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above association was held at the Blackfriars Hotel, Manchester, on Wednesday, July 6th, 1881.

A. LAWSON, Esq., President, in the chair.

Present: Messrs. T. Greaves, P. Taylor, T. Taylor, W. Dacre, T. Hopkin, W. A. Taylor, J. B. Wolstenholme, J. W. Ingram, and R. Ryan, Manchester; Professor Steel, T. A. Dollar, London; J. W. Moore and R. Reynolds, Liverpool; W. Woods, Wigan; W. Whittle, Worsley; J. Litt, Bolton; A. M. Michaelis, Stockport; W. A. Briggs, A. Darwell, H. Ferguson, E. Leech, and the Secretary.

Letters were received from the following gentlemen, regretting their inability to attend the meeting: Messrs. G. Fleming, John Lawson, J. Mather and Son, C. W. Elam, J. Howell, H. Thompson, J. Welsby, W. A. Cartwright, and Professor Williams.

The minutes of the last meeting having been read and confirmed, the following gentlemen were unanimously elected members of the association: Mr. James Lambert and Mr. Ashworth. The following gentlemen were nominated for election at the next meeting: Mr. E. Leech, of Worsley, and Mr. J. W. T. Moore, of Liverpool.

The SECRETARY then read copy of petition which the office-bearers

had forwarded, since the last quarterly meeting, to the Right Hon. Earl Spencer, K.G., Lord President of the Privy Council, in regard to the "Veterinary Surgeons' Bill" now before Parliament.

Mr. PETER TAYLOR proposed a vote of thanks to the office-bearers for the trouble they had taken with respect to the above. Seconded by Mr. T. A. DOLLAR, and carried.

Mr. E. FAULKNER then read the correspondence with regard to the "British National Veterinary Congress." In the discussion which followed members were still of opinion that the rule in reference to the Highland and Agricultural Society's graduates was very objectionable, and, in accordance with the resolution passed at the last quarterly meeting, the committee have resigned, and the present meeting unanimously confirms the resolution.

Mr. J. H. STEEL said he was in hopes the Congress would yet be a grand success, and that it would be truly a national one. We have representatives from England, Ireland, and some parts of Scotland, and very likely Australia, Canada, and the Continent. He was very sorry to hear the decision of this meeting, and had special reasons why he did not wish for the opposition of the Lancashire section. The Central Committee had in no way intended to slight the members of the Highland and Agricultural Society, but, in fact, given them a place of honour, same as given to medical men—viz., that as guest, and all who attends as such shall be cordially received. I hope the Lancashire Veterinary Medical Association will modify its views, and join us even at the last, and give us a continuance of the support which you gave us at the commencement of the movement.

Mr. T. TAYLOR proposed that the ordinary business of this meeting be postponed, so that the members could have an opportunity of fully discussing the Veterinary Surgeons' Bill, at present before Parliament. Seconded by Mr. W. DACRE, and carried.

A very animated discussion followed respecting the above Act, the majority of members being quite in favour of the Bill, as amended in Committee (a copy of which was kindly brought by Mr. Dollar), a material alteration being made in section 15, clause 4, being as follows: "The names of the persons registered under this section shall be placed in a separate division of the Register of Veterinary Surgeons under the heading '*Existing Practitioners*,' but no such person shall be deemed to be a member of the said Royal College within the said Charters or this Act."

Some members took exception to the retrospective period, considering five years much too short a time as qualifying persons to be registered, and the following resolutions were unanimously carried:

Mr. WOLSTENHOLME proposed, and Mr. FAULKNER seconded—

"That this meeting desires to record its appreciation of the services rendered the profession by its Council in the arduous task of promoting the Veterinary Medical Bill in Parliament, and expresses its confidence in the Council during the further stages of the Bill."

Mr. W. A. TAYLOR proposed, and Mr. T. A. DOLLAR seconded—

"That this Society do petition the Parliamentary Committee of the Council of the Royal College of Veterinary Surgeons to secure, *if possible*, during the passage of the Veterinary Surgeons' Bill through the House of Commons, an increase in the 'retrospective period' as qualifying persons to be registered as 'existing practitioners.'"

Mr. PETER TAYLOR begged to thank the members of this association and others who had given him their support and again returned him as Member of Council of the Royal College of Veterinary Surgeons.

Mr. J. B. WOLSTENHOLME exhibited a very good specimen of the "Trichina spiralis."

A vote of thanks to the Chairman closed the proceedings.

SAM. LOCKE, *Hon. Sec.*

GLASGOW VETERINARY COLLEGE.

THE summer session of this institution terminated on the 8th July, and on the 12th, 14th, 18th, and 19th the oral examinations of the Royal College of Veterinary Surgeons were conducted within the museum of the College. The membership diploma of the Royal College of Veterinary Surgeons was gained by Mr. John Wright, Troon; Mr. John Taylor, Cathkin; Mr. W. D. Hunter, Meikleour, Perthshire; Mr. M. Y. Lees, Glasgow. The second professional examination was successfully passed by Mr. Hayes, Portroe; Mr. Magill, Hilltown; Mr. O'Connor, Castle Island; and Mr. Herron, Stirling. The first examination was passed creditably by Messrs. Johnson, Belfast; Reid, Magheramore; Ross, Ballymena; Tweedley, Barrhead; Frazer, Largs; Craig, Glasgow; Laithwood, Congleton; Spalding, Blairgowrie; Carnachan, Stranraer; Marriott, Warwick; M'Nair, Helensburgh; Weir, Coll; Scouller, Kippen; Holland, Dublin; Gregor M'Gregor, Kippen; and Larkin, Carlingford. Medals granted by the Highland and Agricultural Society of Scotland, Principal M'Call, and certificates of merit granted by the College were awarded in the different branches of study as follows:—

Botany.—Silver medal—Mr. Robert M'Nair. First-class certificates—Messrs. Laithwood and Tweedley. Second-class certificates—Messrs. Jones, M'Millan, and Anderson.

Chemistry.—Silver medal—Mr. Laithwood. First-class certificates—Messrs. Anderson, Holland, and Marriott. Second-class certificates—Messrs. M'Nair and Jones.

Materia Medica.—Silver medal—Mr. Williams, Portmadoc, Wales. First-class certificates—Messrs. Laithwood and Gibson. Second-class certificates—Messrs. Jones, Reid, Holland, and Tweedley.

Best oral examination on Botany, Chemistry, and Materia Medica.—Gold medal, Mr. Holland.

HIGHLAND AND AGRICULTURAL SOCIETY.

A SPECIAL meeting of the directors of this Society was held at Edinburgh, on July 6th, Mr. Dingwall, Ramornie, in the chair.

The SECRETARY (Mr. F. N. Menzies) stated that, in accordance with the resolution at the last general meeting, the Earl of Mar and Kellie had presented the petition and given notice of the necessary amendment on the Veterinary Surgeons' Bill, introduced into the House of Lords by Lord Aberdare. The Marquis of Lothian agreed to second the amendment, and the Duke of Buccleuch and a great many of the Scotch peers were prepared to support it. Lord Aberdare and the Lord President, however, agreed to accept the amendment, and in the Bill, as amended in committee on recommitment, the holders of the Society's veterinary certificate are duly recognised as veterinary surgeons. By an amendment introduced by the Earl of Camperdown, the Royal College of Veterinary Surgeons is bound to make provision in the manner permitted by their charters for the examination in Scotland of the students attending the several Scotch colleges, and to admit and register such students as have passed the examinations as members of said Royal College, under the provisions of such charters and this Act.

Parliamentary Intelligence.

House of Commons, July 1st.

VETERINARY PORTAL INSPECTORS.—Mr. HEALY asked the Chief Secretary to the Lord-Lieutenant of Ireland on what principle veterinary portal inspectors were appointed by the Lord-Lieutenant in Ireland; whether any persons were appointed who were not members of the Royal College of Veterinary Surgeons; and whether, in appointing inspectors to the local authorities under the Contagious Diseases (Animals) Act, 1878, a qualified man (as above) was always appointed in preference to one non-qualified.

Mr. FORSTER said the Lord-Lieutenant could dispense with the qualification of membership of the college under special circumstances.

House of Lords, July 5th.

VETERINARY SURGEONS' BILL.—The report of amendments to this Bill was agreed to.

House of Lords, July 7th.

VETERINARY SURGEONS' BILL.—This Bill was brought up for third reading, and passed.

House of Commons, July 11th.

ARMY VETERINARY SURGEONS.—Major O'BEIRNE asked the Secretary of State for War whether certain actuarial calculations, bearing upon the reconsideration of the Army Veterinary Warrant of 1878, and which the late Secretary of State for War stated in the House of Commons on the 7th August, 1879, were necessary in order to enable him to form an opinion as to the necessity of altering the terms of the Warrant in question, had been completed, and, if so, had he come to any conclusion as to the reasonableness of the complaints of army veterinary surgeons as regards the operation of the Warrant of 1878, and if it was contemplated to modify the terms of the present Warrant, so as to remove the disabilities complained of?

Mr. CHILDERS, in reply, said he found that the actuaries' calculations to which he referred were completed in September, 1879, but that after considering them the late Government determined not to alter the Warrant of 1878.

House of Commons, July 12th.

VETERINARY SURGEONS' BILL.—This Bill was read *for the first time*, being introduced by Mr. Mundella, Vice-President of the Privy Council.

House of Commons, July 18th.

The Veterinary Surgeons' Bill was read a second time.

House of Commons, July 22nd.

VETERINARY WARRANTS.—Major O'BEIRNE asked the Secretary for War whether he would consider the grievance of officers who were induced to enter and remain in the service under the conditions of the Veterinary Warrant of 1859, and find their position and prospects altered to their disadvantage by the terms of the Warrant of 1878.

Mr. CHILDERS said: I have to point out to my hon. and gallant friend that there is a great difference between being eligible for, and being entitled to, a particular rank. It is true that the Warrant of 1859 made veterinary surgeons eligible for the rank of captain after five years' service; but, as a matter of fact, vacancies were not taking place in 1878 which admitted of promotion within double that time, and before long no veterinary surgeon would probably have become a captain under seventeen years' service. The

Warrant of 1878 gave them rank absolutely after twelve years' service. The whole arrangements about veterinary surgeons had been so recently settled by my predecessor that I have been reluctant to reopen the question this year; but I will look into it during the autumn, especially with reference to relative rank.

Army Veterinary Department.

Gazette, June 28th.

VETERINARY DEPARTMENT.—Inspecting Veterinary Surgeon A. J. Owles has been placed on retired pay.

Obituary.

THE death is announced of W. Waugh, M.R.C.V.S., Stirling, Scotland, who graduated in 1846.

We deeply regret to have to report the death of R. L. Hunt, F.R.C.V.S., of Birmingham, whose protracted and serious illness had, however, somewhat prepared us for the sad intelligence. In him the profession has lost one of its most respected, faithful, and useful members. Mr. Hunt graduated in 1843, and was elected a Member of Council in 1860, having been Vice-President in 1858, and again in 1876 and 1878, in the intervening years being Councilman. He held the office of President of the Royal College in 1864-5, and from 1872 to 1877, when he was seized with the illness which ultimately carried him off, he was an examiner in the English and Scotch sections of the Examining Board. Genial in disposition, courteous in manner, and ever devoted to the best interests of the profession, our deceased colleague was highly esteemed for his integrity, honesty of purpose, and all those qualities which rendered him a worthy representative of our body.

Correspondence, etc.

THE PATHOLOGY OF NAVICULAR DISEASE.

SIR,—At a meeting of the Southern Counties Veterinary Medical Association, reported in the July number of the VETERINARY JOURNAL, Mr. G. Fleming, the President, produced a specimen of Navicular Disease* in support of his views that the disease commences in the bursa which covers the posterior surface of the bone; and he contends that Navicular Disease commences on the surface of the navicular bone, and not in the interior of the bone itself. Mr. Fleming states his reasons to be as follows:—That in the Navicular Disease, unless it is extremely advanced, we find the articular cartilage healthy; we never find the two surfaces of the bone involved, but we always find the surface that is in contact with the tendon implicated. If it began in the interior, we should have the articular surface of the bone and cartilage involved. When you have the whole tissue of the bone involved you have the articular surface: it is only in the very advanced stage you have this surface diseased. Mr. Martin supports the President's views, and states that he has several specimens in which the tendon is attached to the under-surface of the bone, and in which there is no disease whatever in the internal parts. Mr. Barford also corroborates the President, and is perfectly convinced that the disease commences in the synovial membrane; also states that where he has found caries in one instance, he has found inflammation of the synovial membrane in twenty or thirty.

* This was of traumatic origin, though the lesions were identical with those of so-called Navicular Disease.—ED. *V. J.*

As my opinion differs entirely from the above-named gentlemen's, I ask the favour of being allowed to state it. About twelve years since I read a paper at a meeting of the West of England Veterinary Medical Association, on Navicular Disease, and illustrated my views by producing nearly three hundred morbid specimens, the whole of which had been dissected by myself or under my own superintendence, and the history of a great many of them I knew well. Since that time I have taken every opportunity of examining new morbid specimens, and have not seen anything to induce me to alter my views in the least. Some years since the opinion was almost general that the disease commenced in the synovial membrane covering the cartilage; however, that cannot be, as there is no synovial membrane covering articular cartilages, and ulceration almost invariably commences about the centre of the navicular bone, and the same holds good as to ulceration of other joints; consequently, it is not near the synovial fringes which are situated around the edges of joints. Another important point to be recognized in the consideration of disease of this joint is that there is no primary disease of the articular cartilages, for pathological anatomy teaches us that all changes that are found in it are secondary to some other affection of the bone. There is no such thing, therefore, as primary ulceration of the cartilages. When cartilage is diseased it is from the extension of mischief from the bone beneath. Articular cartilages are not vascular: they are nourished by cell imbibition.*

The first stage of Navicular Disease, whether it be hereditary or from other causes, is that of congestion of the vessels of the cancelli of the bone, and it may be so slight as to quickly pass away after a little exercise; but if the same cause be still in operation, the congestion will be renewed, until a low form of inflammation is set up, and the nutrient properties of the bone interfered with, as well as the secretion of synovia. This stage of the disease causes an aching pain, which interferes more or less with the action of the animal, depending on the degree of the inflammation. Now this state may exist for months with but slight altered action, or lameness, and that of an intermitting character. If the disease progresses, there will be softening and enlarging of the cancellated structure of the centre of the bone, where the nutrient action is lowest; the cells break up, absorption takes place, producing the first stage of molecular death, or what is termed dry caries. In some cases this process goes on until a considerable portion of the internal structure of the bone is destroyed, without producing any granular degeneration of the articular surface of the cartilage.

But much more frequently this perverted nutrition of the bone produces granular degeneration, first of the natural cartilage cells which are embedded in the hyaline matrix, and secondly of the hyaline matrix itself. Let a cartilage cell undergo this granular degeneration, and the granules, by accumulation and multiplication, form a cavity in the hyaline matrix; then let this cavity burst on the surface of the cartilage into the joint, and an excavation which can be seen by the naked eye is at once visible, and a

* Our correspondent is in error if he supposes we consider the surface of the navicular bone in contact with the perforans tendon to be covered by articular cartilage. It is not, but the two surfaces articulating with the os pedis and os corona are; and this constitutes the difference in the seat of the disease. The infero-posterior surface of the bone—that primarily involved in Navicular Disease—is covered by fibro-cartilage, which is liable to disease like fibro-cartilage covering bones elsewhere; while the two articular surfaces, which are never involved until the whole mass of the bone is implicated, are covered by hyaline cartilage. This peculiarity makes all the difference in the pathology of the malady, which, we have always maintained, commences in the bursa, and nowhere else. This is not a joint or articulation, properly speaking, and the cartilage is not hyaline.—Ed. *V. J.*

so-called ulcer is produced. In an early stage of the disease this granular degeneration may only be detected by a microscopical examination; yet in that early stage the microscope will always detect a spot of degenerated change taking place in that part of the tendon which has been in opposition to the ulcerative spot of the cartilage, producing a gelatinous degeneration of the fibres, or a kind of dry ulceration, which has often been mistaken for laceration, the result of sprain and friction. A yellowish plastic matter is now often thrown out, which unites those fibres of the tendon which have undergone the degenerative change with the diseased structure of the cartilage. In some cases only a few fibres become attacked; in other cases the entire articular surface of the bone and tendon become firmly adherent, producing an anchylosed joint, after which the pain is much lessened; but the animal goes in a very stilty manner, and not fit to go out of a walking pace. In some cases the degenerative change goes on in the tendon without the plastic process being set up, until there is not one-half of the articulating part of it left; yet it seldom becomes ruptured unless the nerves are divided.

I have many specimens showing where nature has repaired a large amount of disease of the cancellated structure of the bone by an effusion of lowly organized lymph, which gradually becomes converted into bone of a porcellaneous character. Cartilage, when diseased, has not the power of regeneration: the small spicula on the articulatory surface of the cartilage is the result of the reparative process of the bone. In my investigation I have not found a case where the commencement of the disease was not clearly traceable to the bone.

Yours truly,

Bath, *July 6th*, 1881. THOMAS D. BROAD.

THE VETERINARY DEPARTMENT IN AFGHANISTAN.

DEAR SIR,—May I venture, through your columns, to call attention to the treatment the veterinary officers have received at the hands of the Government and military authorities during the late Afghan campaigns?

Although some few members were mentioned by the generals under whom they served, and it was universally admitted that no body of officers more thoroughly and satisfactorily fulfilled the arduous duties imposed upon them, yet when the time arrived for some public acknowledgment of their services the Veterinary Department found themselves entirely ignored.

So far has this principle of avoiding all mention of the department been carried out, that even in the final despatches of his Excellency the late Commander-in-Chief in India, when all branches of the service were especially mentioned and complimented on their good services during the campaigns, the members of the Veterinary Department alone received no single word of praise or thanks. This pointed omission would convey to most minds the idea that we have been unworthy of having our services in any way recognized. If this be not the reason for our exclusion—which it certainly is not, if the testimony of general and commanding officers be worth anything—then why, in common with our brother officers, should our services not receive due recognition?

It may not be generally known what responsible duties fall to the veterinary surgeon while on active service. It is mainly on him that the efficient working of the transport depends; for the transport officers are generally men who know nothing of the work required of them. Instead of being selected for his especial qualifications, the transport officer is often a man who is tired of regimental duty, or of whom his colonel would gladly see a little less, who either volunteers for, or is appointed to the transport, or, as in the last campaign, is a young civilian police-officer, more at home in "running 'em in." These inexperienced men know nothing of the habits of,

or the care necessary for the animals in their charge; consequently the brunt of the work falls upon the unhappy veterinary surgeon, whose time is greatly taken up in endeavouring to rectify their involuntary blunders. The selection and purchase of transport animals, buying of forage, fitting of pack saddles and other gear, paying and management of large establishments, amounting to thousands of animals and men—as, for instance, the leviathan hospital depôts of Peshawur and Jhelum—are some of the very onerous duties frequently devolving on the veterinary surgeon. Surely, if he is capable of bearing such large responsibilities (thousands of pounds passing through his hands almost daily), he may consider himself entitled to some reward for his services. Even looking at our grievances in a purely pecuniary light, we have not been fairly treated; for while the transport officer receives from 150 to 600 rupees staff salary *per mensem* in addition to his regimental pay, the veterinary surgeon has to do at least ten times the work without a cent of extra pay. That the duties which fell to the share of the veterinary surgeons during the campaigns were no sinecure is amply shown by the large proportion who, succumbing to the climate and hard work, either died on service or were invalided to the hills or home. Great surprise was felt by all when the Afghan Gazette came out that no name of any veterinary officer appeared therein; but we were consoled with the idea that they would do so in the supplementary Gazette that was to contain the names of those omitted in the first. This forlorn hope has also failed, and all the fruit of our labours during the two campaigns is *some talk* of two veterinary surgeons being promoted to first class grade. The promotion of two junior officers only, out of the large number who distinguished themselves by their zeal and ability, is but a very poor reward to bestow on the department. Surely a larger number were deserving of the same favour!

The case of the senior officers seems to be almost without remedy. We are told the old story of there being no vacancies to be filled up. Among the other branches of the service the difficulty is tided over by the brevet rank. I would venture to suggest that the same thing might with advantage be instituted in the Veterinary Department. Why not bestow a brevet rank of Inspecting Veterinary Surgeon? But if it carries with it no extra pay, what will it profit you? the authorities may ask. In the first place, it would carry a recognition of good services which were considered worthy of notice; and, secondly, it would secure for the officer on whom bestowed many privileges in choice of quarters, of baggage allowance, and cabin accommodation on board troop-ships, also precedence for promotion as vacancies occurred. These may be small advantages, but they would cost the Government nothing to grant, and would conduce greatly to our comfort when knocking about from place to place, which under the departmental system will be more frequent than ever. Another small favour which might well be bestowed on those officers who have been especially brought to notice for their services in Afghanistan is a remission of all examinations for promotion to next higher grade, and that those officers appointed under Royal Warrant dated 22nd April, 1878 (whose services may be dispensed with on completion of ten years' service), who have served in either of the late Afghan campaigns, might be specially selected for further employment in preference to those who have seen no service, provided they are eligible in every other respect. The Gazette of Afghan honours contains the names of several medical officers who have been made C.B.'s for their services. After the slights and rebuffs our unfortunate department receives from the highest military authorities, it may be considered altogether too presumptuous an idea for me to suggest that some of our senior officers were not quite unworthy of receiving a similar mark of esteem, if only in the person of the Principal Veterinary Surgeon in India, who, we all know, did not spare any personal exertions or shirk ex-

posure to the baneful climate of the Khyber, where so many of our brave fellows have fallen victims to disease, in order to render every aid to ensure the successful working of the transport when so much was depending on it.

I must apologize, Mr. Editor, for taking up so much of your valuable space; but I do so in the hope that those who have both the influence and ability to bring these matters to notice will endeavour to ameliorate the present most unsatisfactory state of affairs. It is very disheartening to feel that, no matter how earnestly and willingly we may fulfil our duties, there is no hope of any other reward than that internal satisfaction which is supposed to accompany the consciousness of duties well performed. While honours, brevets, and decorations have been sown broadcast among all who took part in the late campaigns—even to the Postal and Telegraph Departments, whose very junior officers have been decorated with the Order of the Indian Empire—nothing has fallen to the Veterinary Department, either in the shape of promotion, decorations, the reward for meritorious service, or even in the very generous fifty pounds, instead of the usual hundred, as granted lately to one of our senior officers for his services in South Africa. It is to be feared that in the event of another campaign volunteers for the front will not be so readily forthcoming; and were the slights and indignities which are the daily portion of the department generally known, they would largely tend to deter youthful aspirants from the folly of entering a branch of the service which may well take for its motto the well-known words of Dante, "Vai che entrane lasciate ogni speranza." I am, dear sir, yours truly,

"ECOSSAIS."

CORRECTION.

IN our notice of the Fitzwygram Prizes competition, in last month's Journal, it was stated that the only candidate, Mr. Dollar obtained one-half of the maximum number of marks. We are asked to state that it should have been three-fourths of the maximum.

A large number of communications are compelled to be held over till next month.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from D. Hutcheon, Cape Colony; T. Hopkin, Manchester; "Ecossais"; W. F. Garside, Paris; H. W. Steel, A.V.D., Woolwich; G. Evans, Ootacomand, Madras; J. B. Mills, A.V.D., India; T. D. Broad, Bath; R. W. Burke, Edinburgh; S. Locke, Manchester; J. D. Overed, Blofield; W. Broughton, Leeds; "Ignoramus"; R. Knowles, Wisbeach; T. Chalwin, Adelaide, South Australia; J. Wilson, Nantwich; C. Gresswell, Nottingham; J. Webb, Bishop Stortford.

BOOKS AND PAMPHLETS: *E. Förniger*, Die Ophthalmoskope in der Veterinär-Medicin; *J. Munk*, Physiologie des Menschen und der Säugethiere; *J. B. Dessart*, Traité de Médecine Legale Vétérinaire; *A. Zundel*, Der Gesundheitszustand der Hausthiere in Elsass-Lothringen; *C. Siegen*, De l'Inspection des Denrées Alimentaires.

JOURNALS, ETC.: *Journal de Médecine Vétérinaire et de Zootechnie; Recueil de Méd. Vétérinaire; Archives Vétérinaires; La Clinica Veterinaria; Wochenschrift für Thierheilkunde; Der Thierarzt; Le Progres Medical; New York Medical Record; American Veterinary Review; Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie; Repertorium der Thierheilkunde; La Presse Vétérinaire; Lancet; Medical Press and Circular; Annales de Méd. Vétérinaire; Archiv für Wissenschaftliche und Practische Thierheilkunde; Field; Mark Lane Express; Medical Times and Gazette.*

NEWSPAPERS: *Bismarck Daily Tribune; Western Morning News; Glasgow News; South Australian Register; North British Agriculturist; Stockkeeper: Modern Society; Pen and Plow; Boston (U.S.A.) Evening Traveller.*